



# Temperature and Humidity Control in Firework Industries Using W1209 Digital Thermostat Temperature Control Board

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## ABSTRACT:

Temperature and humidity control are important for a multitude of industries to have efficient productivity. Maintaining optimal moisture levels is common in industrial applications such as food, pharmaceuticals, and manufacturing, but it is also used in the firework industry.

Not only is it beneficial for the production process, but also for the well-being and health of the employees. Nowadays, the majority of the fireworks factories are experiencing more explosions as a result of the high temperatures in the work area and warehouse; at the same time, they are experiencing a loss in sales and production due to humidity. In this project, we are going to control the temperature and humidity of industries using the W1209 digital thermostat temperature.

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## 1. INTRODUCTION:

Temperature and humidity monitoring and control system has wide use in Practical world of machines that are ruined due to temperatures. It also affects agro, firework based industries. The present paper pronounces the scheming of a temperature and humidity monitoring system.

This project is capable sense the humidity level and automatically increases or decreases the temperature according to the industries. The need of such project is on high demand at firework industries. This fields, requires a precise monitoring method for the temperature and humidity. Any variation from the actual environment may lead to huge (firework industries) losses and May due to increased temperature it lead to fire accident. Mostly fire accident in firework industries are occurs on India and many daily wage workers are died.

The designed device helps in monitoring and displaying the value to user ahead of the damage and automatically it changes the temperature and the prevention may be done on time. The designed idea is implemented by us in different scenarios to test and is executed successfully.

In the present scenario the temperature and humidity sensing is so wide in demand. So this project is about designing a temperature and humidity control board to provide a low cost solution for engineering, research laboratory, workshops, industries and house-hold uses. A W1209 digital thermostat temperature control board is implemented based on my idea.

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## 2. SYSTEM SPECIFICATION:

Here, we go over the concept guiding IOT-based real-time temperature and humidity control on industries. A W1209 digital thermostat temperature microcontroller, and a waterproof temperature detection sensor, including 40w Electric Bulbs as source for temperature, and to maintain the temperature dispenser fans were used to make up the system.

W1209 digital thermostat temperature microcontroller is connected to the sensor, blub and dispenser fan to maintain the temperature

The sensor connected to the controller detects the temperature of the closed surface area like industries, factories. The detected temperature in conveyed to the controller. Already the temperature wants to maintain on the closed surface area is pre-set on the controller (eg.38°C). If the temperature is below the pre-set means controller gives the power supply to the Electric Bulb to increase the temperature, if it is exceed means controller cut down the power source to the Electric Bulb and gives to dispenser fan to dispense the heat in the industry.

### 2.1 HARDWARE CONFIGURATION:

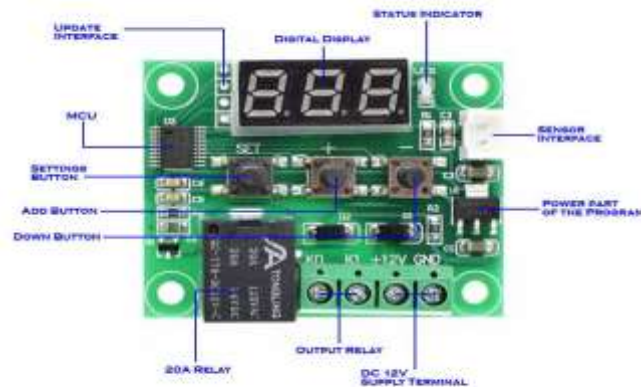
- W1209 digital thermostat temperature microcontroller
- Waterproof DS18B20 Digital Temperature Sensor
- 40w Electric Bulb

- Dispenser fan

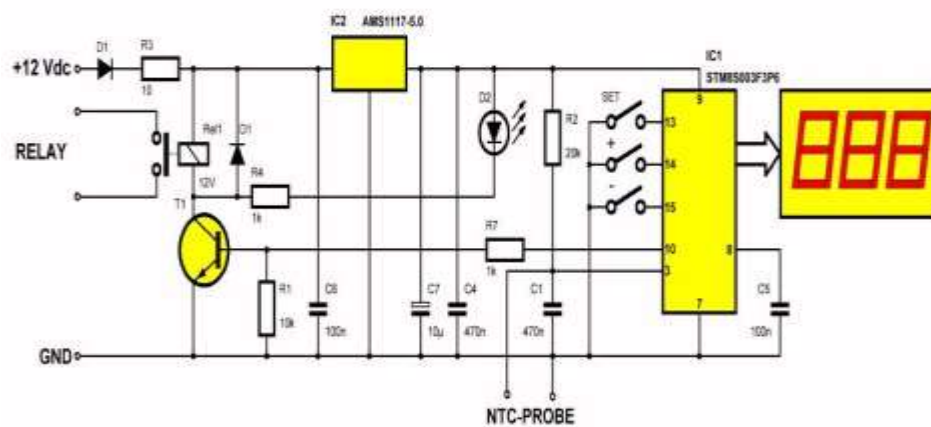
### 2.1.1 W1209 Microcontroller

The W1209 digital temperature controller thermostat module is a small, standalone device that allows you to control the temperature of a system or process using a digital interface. It typically includes a Waterproof DS18B20 Digital Temperature Sensor, a control algorithm, and an output mechanism to control the temperature. The W1209 module may have inputs for setting the temperature set point and control parameters, as well as outputs for controlling devices such as heating elements or cooling fans. It may also have a display for showing the current temperature, set point, and other information. The module is designed to be easily integrated into a larger system or device. With this W1209 Digital thermostat controller, you can intelligently control power to most types of electrical devices based on the temperature sensed by the included high-accuracy NTC Waterproof DS18B20 Digital Temperature Sensor.

Temperature sensors, keys, 7 segments LED display, relays, and a DC 12 power supply are all features of the W1209 thermostat controller. It is a cost-effective thermostat controller of high quality.



Thermostats are tools that monitor a system's temperature to keep it at or close to the desired set point. The module's NTC Waterproof DS18B20 Digital Temperature Sensor enables intelligent temperature-based control of a variety of electrical components. The resistance of an NTC thermostat lowers as temperature rises because of its negative temperature coefficient. Because the W1209 thermostat has an embedded microcontroller built-in, little programming experience is needed. The W1209 has three switches that can be used to set up the different parameters, such as the ON and OFF trigger temperatures. The relay can be turned on at voltages as high as 240V AC at 5A or 14V DC at 10A. The state is displayed with the aid of the LED on the W1209 thermostat, and the temperature is displayed in degrees Celsius with the aid of a 7-segment display and a relay.



### 2.1.2 Waterproof DS18B20 Digital Temperature Sensor:

This sealed digital temperature probe lets you precisely measure temperatures in wet environments with a simple 1-Wire interface. The DS18B20 provides 9 to 12-bit (configurable) temperature readings over a 1-Wire interface, so that only one wire (and ground) needs to be connected from a central microprocessor.



### 2.1.3 Electric Bulb:

Electric bulb is used as a source for the heat which is helpful to maintain the certain temperature on the industries. It is Connect to the microcontroller.

### 2.1.4 Dispenser Fan:

Dispenser fan is used to reduce the heat if it is exceed than the presetted temperature. It is acts as an exhauster to remove the heat from the industries.

## 2.2 MATERIALS AND METHOD:

The block diagram for the proposed system is shown in the Figure 1. It consists of an W1209 digital thermostat temperature microcontroller which is interfaced with the following components: Waterproof DS18B20 Digital Temperature Sensor for measuring temperature and humidity; Digital Display - for displaying the operations of the system; Dispenser fan - for cooling and exhaust the heat from firework industries; Electric bulb - for heating the firework industries whenever the temperature within is below the desired range.

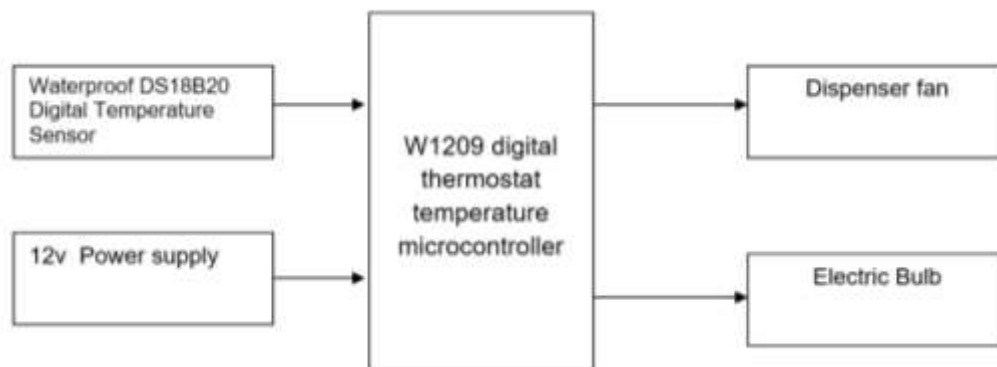


Figure 1: Block Diagram for the Temperature-Humidity control system

## 3. SYSTEM STUDY:

### 3.1 EXISTING SYSTEM:

The older version for this model works as similar to an embedded circuit. It worked as transmitter it transmits the current temperature of the industries to the workers and management respectively.

A sensor module interfaced with microcontroller circuit continuously read the actual temperature and relative humidity of the environment

And these values are sent to the display unit for the LCD display's first row. On the other side, a resistive touch screen is used to set the desired values of temperature and relative humidity manually

These values are sent to the display unit for the LCD display's second row as well used for the control section to control the overall process. If there is no manual values are set, then it will display only current temperature and relative humidity of the environment.

### 3.1.1 DRAWBACKS:

- It displays only the temperature level
- Precautions wants to take by the peoples
- Human power takes place
- The output values can be changed by anybody
- Accidents may occurs some time

### 3.2 PROPOSED SYSTEM

We all know that each and every thing need preservation like finely produced products like agro, chemical, pharmacies, food, beverages, etc. without preservation nothing can long last forever. Temperature and humidity plays major role in preservation.

Temperature and humidity are an environmental concern that is relevant to many industries, as air temperature increases; air can hold more water molecules, and its relative humidity decreases. When temperatures drop, relative humidity increases. High relative humidity of the air occurs when the air temperature approaches the dew point value.

The concept guiding IOT-based real-time temperature and humidity control on industries .This system is being suggested for use in firework industries to reduce the accident rate in industries.

This system takes care of flow of temperature and humidity management in firework industries. Microcontroller board has led screen which shows the current temperature of the closed area, the system has been created so that it will continuously check the level of temperature and humidity that is available.

The system was developed using a circuit python This system used the temperature sensor to detect the temperature of the industries and automatically increase or decrease the temperature accordingly to the temperature is already pre-set on the microcontroller.

## 4. CONCLUSION:

In this paper, a microcontroller-based temperature, humidity measuring and control system was implemented in firework industries. The Waterproof DS18B20 Digital Temperature Sensor is used to sense and measure the temperature and humidity. We developed the advanced version of maintaining the temperature and humidity of the warehouses and factories, it is mostly used for reduce the accident occurs in the firework industries. It detects the temperature and displays the temperature to the workers and management to take and it automatically decrease the heat on industries with dispensers.

This project is on small scale and it can able to develop on large scale like for ammunition factories, and military weapon warehouses and in order to save the foods during natural disasters.

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