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Implementation of a Child Rescue System From Borewell Using Wifi for Long Range Applications

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Abstract:

In India for recent days individuals are confronting what is happening like kid have fell in the drag well and struck in the opening which is revealed and getting caught. Salvage of caught kid from bore well is exceptionally unsafe and troublesome interaction when contrasted with different mishaps. It requires over a day to save the youngster. Here, in this paper the kid who is stuck inside the opening is to be saved by the Gripper what pick and spot the youngster with the assistance of far off regulator. The Gripper is left inside physically by the rope limited at its options. In this elective situation there won't be any necessities of digging opening corresponding to the drag well. The kid can be saved inside a brief timeframe with no challenges.

Keywords **—Gripper,Wireless, Nodemcu,Bore well, Lcd.**

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I. INTRODUCTION

Water shortage is the serious issue looked by human culture presently. As of late numerous mishaps of youngsters falling in the open drag well have showed up. Not many youngsters have been saved in such mishaps. Many were kicked the bucket because of absence of oxygen and absence of time-frame they had taken to save the youngster. Regardless of whether safeguarded late, most casualties were allegedly harmed. This unwanted drag wells have become passing pits and begun taking many lives particularly little kids. The occurrence of losing lives caught in bore very much was featured in 2006 where a 5 year old youngster named Prince was safeguarded by Indian Army specialists after an intense battle which endured up to 49hrs. Report expresses beginning from 2009-2016 a bigger number of than 36 kids fell into the drag well subsequently. So saving a youngster from the drag all around turned into a trouble and an unsafe cycle. A little deferral in the salvage interaction can lose his/her life. Despite the fact that the important oxygen, expanding temperature and mugginess in such profundity will be one more endanger for youngster life. To tackle what is happening the salvage framework is intended to save the youngster inside the drag well and the plan is named as "execution of a kid salvage framework from bore well involving Wi-Fi for long reach applications" which is sent inside and keeps down the caught kid methodically

II. BLOCK DIAGRAM

In order to overcome the drawbacks of the existing system, a new system is proposed which rescues the child from the bore well. The Smart and Safe child Rescue System consists of Temperature sensor (DHT11), Gas sensor (mq4), Web camera and the Gripper. The sensors are under the control of nodemcu microcontroller and are attached with the Gripper. The Gripper is controlled by the DC motor. A Esp32 camera is fixed in the arm facing the ground through which we can view in PC and can come to know the status of the child inside the well. Since it is not a night vision camera an LED fixed with it. Once it is inserted the temperature sensor senses the temperature of the environment and

shows the result in the LCD and then within a second the gas sensor detects the gas and displays the result in LCD.

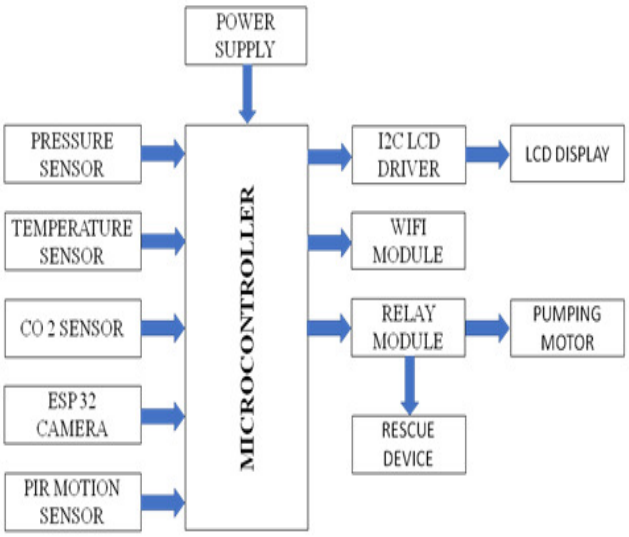

Figure 2.1 Block Diagram

A. NODE MCU:

The NodeMCU (Node MicroController Unit) is an open-source software and hardware development environment based on the ESP8266, a low-cost System-on-a-Chip. The Espressif Systems ESP8266 contains all of the essential components of a computer, including a CPU, RAM, networking (Wi-Fi), and even a modern operating system and SDK. As a result, it's a great fit for a variety of Internet of Things (IoT) projects.

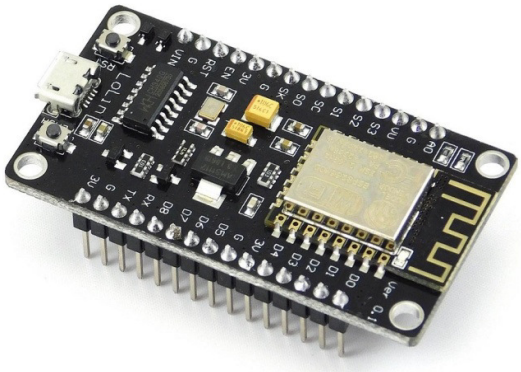

Figure 2.1.1 NodeMcu

The main component of the proposed system is a Node mcu microcontroller that runs on a Esp8266. It requires a 5 volt power supply, which can be built using a step converter, rectifier, filter, and regulator, among other components. Node mcu is in charge of the system's four most important components. There are readings from the BMP180, MQ135, DHT11, and PIR sensors, and the Node mcu activates the relay switch and displays a message on the LCD about the time slot.

B. ESP32 CAMERA MODULE

The accompanying figure shows the ESP32-CAM pin out (AI-Thinker module). ESP32-CAM is a minimal expense ESP32-based advancement board with installed camera, little in size. It is an ideal answer for IoT application, models developments and DIY projects. The board coordinates Wi-Fi, customary Bluetooth and low power BLE , with 2 elite execution 32-cycle LX6 CPUs. It embraces 7-stage pipeline engineering, on-chip sensor, Hall sensor, temperature sensor, etc, and its principal recurrence change goes from 80MHz to 240MHz. Completely agreeable with WiFi 802.11b/g/n/e/I and Bluetooth 4.2 guidelines, it very well may be utilized as an expert mode to fabricate a free organization regulator, or as a captive to other host MCUs to add organizing abilities to existing gadgets ESP32-CAM can be generally utilized in different IoT applications. It is reasonable for home brilliant gadgets, modern remote control, remote observing, QR remote recognizable proof, remote situating framework signals and other IoT applications. It is an optimal answer for IoT applications..

FEATURES

- Clock speed up to 160MHz, computational power up to 600 DMIPS
- 520 KB internal SRAM, 4 MB external SRAM
- Supports UART/SPI/I2C/PWM/ADC/DAC
- OV2640 and OV7670 cameras are supported, and there is a built-in flash bulb.
- Allows for image upload through Wi-Fi
- TF card compatibility
- Multiple sleep modes are supported.

- FreeRTOS and Lwip Embedded
- STA/AP/STA+AP operation modes are supported.
- Smart Config / AirKiss technology support
- Local and remote firmware upgrades for serial ports are supported.

SPECIFICATION

- SPI Flash: 32Mbit by default
- RAM: 520 KB built-in + 4 MPSRAM external
- Bluetooth: BR/EDR (Bluetooth 4.2) and BLE (Bluetooth Low Energy) standards
- 802.11b/g/n/e/i Wi-Fi
- Interfaces supported: UART, SPI, I2C, and PWM
- Support for TF cards (maximum 4G)
- Number of IO ports: 9
- Default Serial Port Baud-rate: 115200 BP

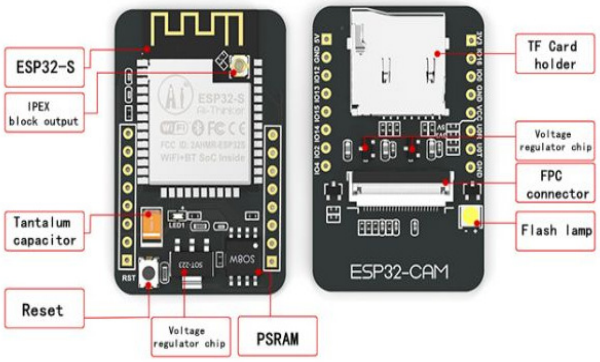

Figure 2.1.2 Esp32 Camera Module

The Esp32 Cam have three GND pins and two power pins 3.3V and 5V. GPIO 1 and GPIO 3 are serial pins. These pins are used for uploading code to your board. GPIO 0 is connected to GNDWhenESP32 is in flashing mode.

C. DHT 11 SENSOR:

The DHT11 is a simple digital temperature and humidity sensor that comes at a reasonable price. It uses a capacitive humidity sensor and a thermistor to monitor the ambient air and delivers a digital signal on the data pin (no analogue input pins needed). It's easy to use, but data collecting requires precision timing. When utilising the Adafruit library, you can get new data from it once every 2 seconds, therefore sensor readings can be up to 2 seconds old. A 4.7K or 10K resistor is included for use as a pull-up resistor between the data pin and VCC.

SPECIFICATIONS:

- 3.3–5V input power supply
- 2.5mA maximum current utilization during conversion (while requesting data)
- Accurate humidity readings of 20-80% with a 5% margin of error
- Accurate temperature measurements from 0 to 50 degrees Celsius.

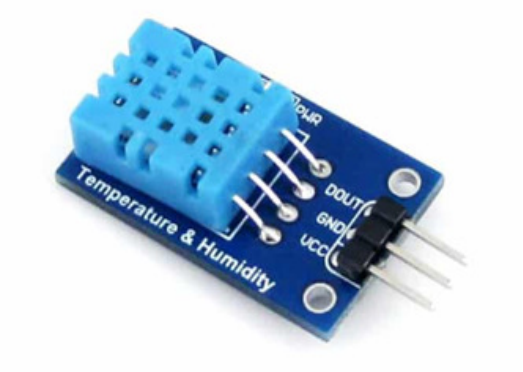

Figure 2.1.3 DHT Module

D. PRESSURE SENSOR

The BMP180 sensor is mainly used to measure atmospheric pressure or biometric pressure. The working principle of the air pressure sensor is very simple, it works based on the weight of air. Because the air around us has a certain weight, and this weight has a specific pressure.

BMP180 Sensor Features

- Temperature and altitude can be measured.
- Range of pressure: 300 to 1100 hPa
- A relative accuracy of 0.12hPa is very high.
- Low-voltage capability
- I2C interface at 3.4 MHz
- Power consumption is low (3uA)
- Time to convert pressure: 5 milliseconds

• Potable size

BMP180 Sensor Specifications

- The bmp180 operates between 1.3 and 3.6 volts.
- The bmp180module has a 3.3v to 5.5v input voltage range.
- 1000ua maximum current
- Standby power consumption is 0.1 ua
- Maximum voltage at sda, scl :vcc + 0.3v
- Temperature range: -40°C to +80°C

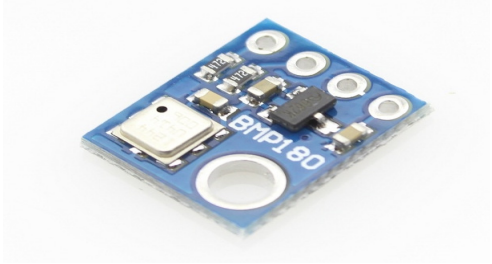

Figure 2.1.4BMP180 Sensor

III. CIRCUIT DIAGRAM

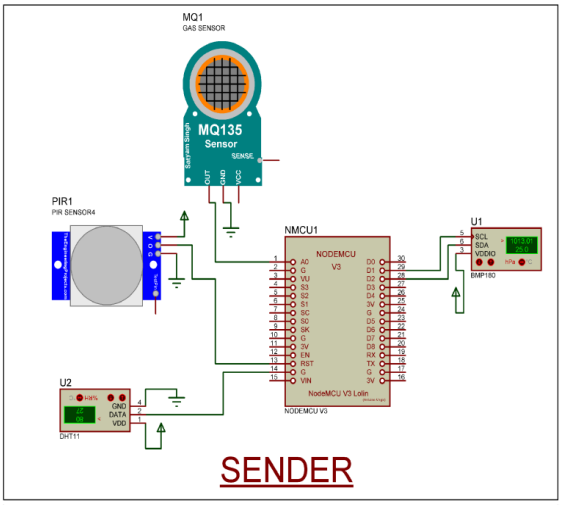

Figure 3.1SenderCircuit Diagram

In this project used Sender nodemcu and Receiver nodemcu. Sender was connected with DHT11, MQ135, BMP180 ,camera and Passive infrared (PIR) sensor. In this system DHT11 used to know temperature and humidity level inside the bore well, Bmp180 used to find atmospheric pressure on bore hole,Co2 sensor used to measure carbon di oxide level in bore well to get babies monitor health and oxygen getting level and its all data transfer to receiver nodemcu. Passive infrared (PIR) sensor used to find whether the baby is active or unconscious. Esp32 camera monitor baby live its connected with mechanical device to recover baby safely.

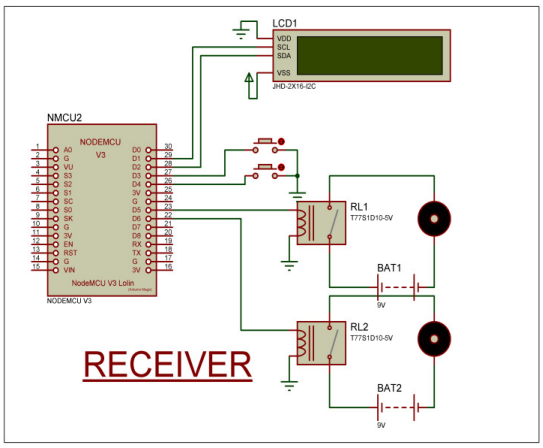

Figure 3.1.1 Receiver Circuit Diagram

The receiver Nodemcu is linked to an LCD display, a button, and a relay module. display shows the values of DHT 11 and the BMP180 sensor. Two buttons are used to control the relay module on and off. relay module control the rescue device up and down motion.

IV. ADVANTAGE

- Initial investment is less
- Easy to maintain
- It reduces labour because of Automatic equipment.
- It's worked autonomously.
- Easy to operate.

V. CONCLUSIONS

This project mainly designed to save many lives of children who fall inside the bore well. In the past 10 years, lots of lives had been lost by falling in to the bore well because digging a pit beside the bore well is very tedious and time consuming process. By using bigger motors, arms and advanced technology this project can be implemented

successfully. This can be concluded that the proposed system can retain the lives of many children who fall into the bore well in future.

FUTURE SCOPE

In future we can use this project in several applications by adding additional components to this project. The structure is made strong enough to sustain all possible loads, though it can be flexible at the same time to adjust wider range of bore diameter and any change in the diameter of bore. We can send these robots to dangerous zones by connecting smoke sensor to the robot we can get the information related concentration of smoke or gases in respective fields and sensor will detect the poisonous gas and it gives information to the Microcontroller and microcontroller gives the information to the transceiver from that we can get the data on the PC side.

ACKNOWLEDGEMENT

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