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Smart D.O.L Starter

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ABSTRACT
The objective of the project is to control the starter from the application and to provide a start motor The starter is turned on/off from the application itself through a Wi-Fi module The webpage is created through which the starter on/off status can be identified and the motor can be turned on/off. Arduino software is used which receives the Wi-Fi module signal from the webpage. The signal from the Arduino in turn controls the starter action through the relay driver circuit. Additionally, the voltage sensor are given as feedback to the Node MCU to protect the motor from overvoltage and overcurrent. Thus the starter can be controlled from the application through the internet.

Keywords: *starter, motor, node mcu, voltage*

I. INTRODUCTION

In the day-to-day, life motors play a serious role in the domestic and industrial sectors. regardless of the sort of providing the motors square measure started mistreatment starters. In industrial sectors, manual operation for ON/OFF of the motor might not be reliable. In several instances, the operators in the room might not be on the market to regulate the motor. Recently the technological growth has paid means for numerous automatic starters and controllers. This project is close to management the starter through the web. however high rating motors need a safe operation. the most objective of this project is to regulate the motor and to produce correct protection for the motor. thus during this project, it's projected to model a tool that is dynamic, low-cost, and wireless within the field of motor dominant. Safety of a motor additionally is additionally} a serious concern as a result of non-functional of a motor will cause a large loss in production also increase maintenance value of the motor itself. That's why safety operations are enclosed during this project. One will observe the motor's operation from a distant place and manage it. The motor starter is controlled from the far off through the Wi-Fi module technique mistreatment Arduino software package. The webpage is formed to access On and Off management of the motor through the Wi-Fi module.

II. WORKING

Wi-Fi Based Motor Starter Control

The main objective of this project is to control the starter. The control is done by wireless signal transmission.

Motor Control

The starter can be turned on or off by using the button which is created on a webpage. The signal is transferred to the receiving side through a Wi-Fi module which is connected to Node MCU. The starter is turned on or off based on the signal.

On/Off State Detection

The signal received from the webpage enables the Node MCU which in turn operates the relay through the driver circuit. The relay thus controls the on/off state of the starter depending upon the signal received.

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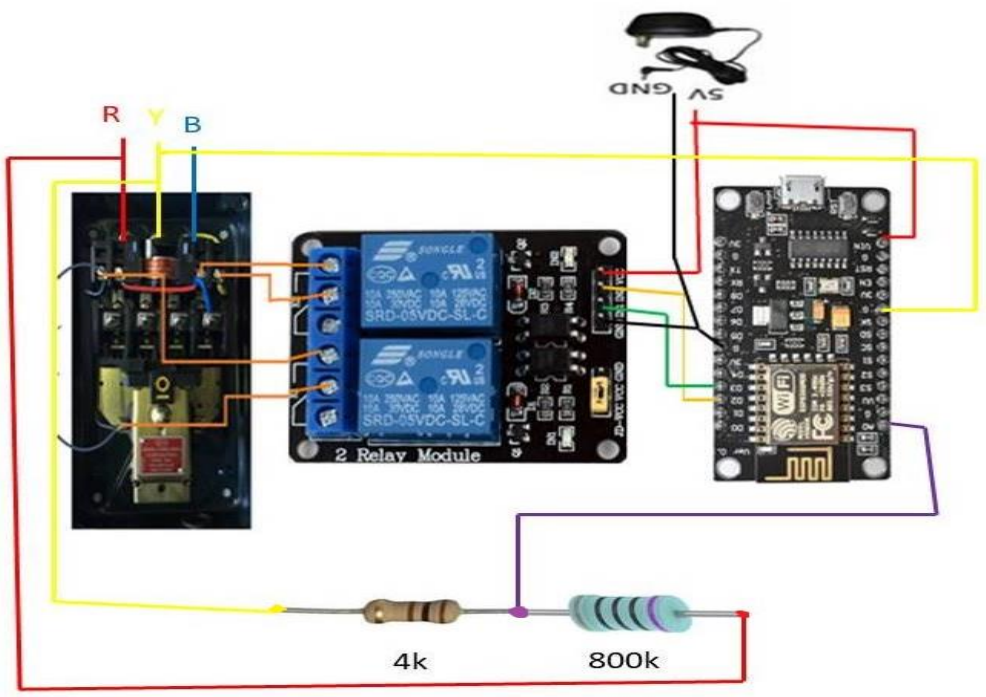
Circuit Diagram



III. MAIN COMPONENTS LIST

a. DOL Starter
b. Relay
c. Power Supply (5)V
d. Node MCU Esp 8266

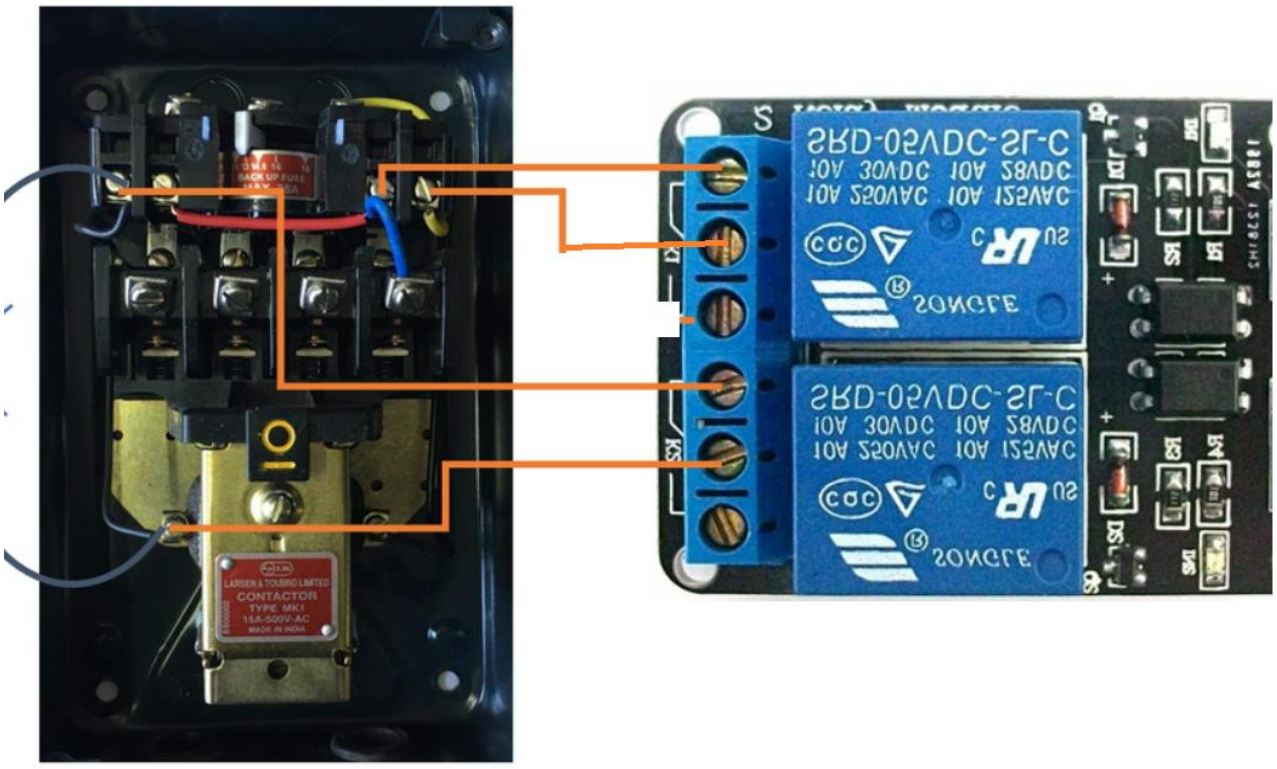
a. DOL Starter

Different beginning ways area unit used for beginning induction motors as a result of Induction Motor attracts a lot of beginning current throughout the beginning. to stop injury to the windings because of the high beginning current flow, we tend to use differing kinds of starters. the only style of motor starter for the induction motor is that the Direct On Line starter. The Direct On Line Motor Starter (DOL) consists of an MCCB logic gate Breaker, Contactor associated with an overload relay for defense. Magnetic force contactor which may be opened by the thermal overload relay underneath fault conditions. Typically, the contractor is going to be controlled by separate begin and stop buttons, associated an auxiliary contact on the contactor is employed, across the beginning button, as a hold to bear. I.e. the contactor is electrically bolted closed whereas the motor is working.

b. Relay:

A relay is an associate electrically operated switch. several relays use an associate magnet to control a switch mechanism automatically, however alternative in operation principles also are used. Relays area unit used wherever it's necessary management to regulate to manage} a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or wherever many circuits should be controlled by one signal. the primary relays were utilized in long-distance telegraph circuits, continuance the signal returning in from one circuit and re-transmitting it to a different. Relays were used extensively in phone exchanges and early computers to perform logical operations. A type of relay that may handle the high power needed to directly drive an electrical motor is termed a contactor. Solid-state relays management power circuits with no moving elements, instead of employing a semiconductor to perform the switch. Relays with the label in operation characteristics and typically multiple in operation coils area unit accustomed shield electrical circuits from overload or faults; in fashionable wattage systems these functions area unit performed by digital instruments still known as "protective relays".

Connection of DOL and Relay



c. Power offer (5)V

The circuit wants voltages, +5V, to work. These voltages are equipped by this specially designed power offer. The power offer, the unsung hero of each electronic circuit, plays a vital role in the sleek running of the connected circuit. the most objective of this 'power supply' is, because the name itself implies, to deliver the specified quantity of stabilized and pure power to the circuit. each typical power offer contains the subsequent sections.

d. Node MCU Esp 8266:

Node MCU v3 likely could be an improvement board that sudden spikes in demand for the ESP8266 with the Express if Non-OS SDK, and equipment upheld the ESP-12 module. The gadget decisions 4MB of memory, 80MHz of framework clock, around 50k of usable RAM, And AN on-chip LAN Transceiver. Node MCU likely could be an infrequent worth IoT Platform with sixteen Digital I/O Pins and one ADC Pin. The code for Node MCU is composed and transferred exploitation Arduino IDE.

Specification:

1) Microcontroller: Ten silica 32-bit diminished guidance set PC hardware X tensa LX106
2) Operating Voltage: 3.3V
3) Input Voltage: 7-12V
4) Digital I/O Pins (DIO): sixteen
5) Analog Input Pins (ADC): one
6) UARTs: 1
7) SPIs: 1
8) I2Cs: 1
9) Flash Memory: four MB
10) SRAM: 64 K
11) Clock Speed: eighty Mc
12) Wi-Fi: IEEE 802.11 b/g/n:

a. Integrated TR switch, balun, LNA, power hardware and coordinating with network
b. WEP or WPA/WPA2 validation, or open organizations

IV. SOFTWARE

Arduino Software

The Arduino Uno could be a microcontroller board supported by the ATmega328. it's fourteen digital input/output pins,6 analog inputs, a 16MHz oscillator, a USB affiliation, an influence jack, an associate degree ICSP header, and a push-button. Arduino is an associate degree ASCII text file natural philosophy prototyping platform supported versatile, easy-to-use hardware and software package. It's meant for artists, designers, and anyone fascinated by making interactive objects or environments. Arduino consists of each a physical

Programmable printed circuit (often named as a microcontroller) and a bit of software package, or IDE (Integrated Development, Environment) that runs on your laptop, accustomed write and transfer code to the physical board.

Advantages

1) Motor is controlled from long distances.
2) Economical style.
3) Is simply enforced in homes.
4) Elimination of timer circuit since exploitation online timer.
5) Is employed by everybody with simply the information of the text.
6) Installation of the app not necessary the user will operate the starter by exploitation and web site there's no ought to install the applying.

APPLICATION: It is put in pumps and fan applications, though they will be incorporated into several different motor applications:

- Fans
- Pumps
- Conveyor belts
- Compressors
- Ventilators
- Mixers
- Milling machines
- Stone crushers

V. FUTURE SCOPE

As there area unit many ideas and innovation that one might implement, there are several innovative ideas which will be processed any or extended any in our project.

VI. CONCLUSION

Thus the project is created to control a starter through Wi-Fi Module. The Node MCU receives the signal from the webserver either to turn on/off the starter. The starter can be turned on/off through the relay driver circuit. The voltage and current sensors are given as a feedback signal to Node MCU for the protection of the motor. Node MCU is programmed in such a way that whenever the current and voltage exceeds above or below the specified value the relay will automatically cut off and the motor stops.

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