

AUTOMATIC SWITCH GEAR SYSTEM FOR AVOIDING VOLTAGE FLUCTUATIONS IN POWER PLANT

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Abstract:

In present day days more power disappointment happens in the industries and laboratory because of power deficiency and request. So In industries, while running an enormous number of electrical devices, we can't ready to work consistently because of power lack. For this situation there are such countless opportunities for mishaps because of abrupt power cut, while making some critical work, which prompts unexpected reduction underway. The principle point of our task is to make a nonstop interaction in the industries for expanding creation by Overcome power disappointment, during the work. This venture has been finished by utilizing PIC IC16F877A(for controlling reason), Current Transformer(for current detecting), DPDT Relay(trip the Supply to the Load's), and so on.

1. Introduction:

In the electric power system switchgear alludes to the mix of electric disconnects fuses and circuit breakers used to seclude the electrical supplies [1,2]. Switchgear is utilized both to de-empower hardware to permit to be done and to clear fault downstream [3]. In this venture we will work the two electrical devices with individual DPDT Relay switch and power supply [4]. In the event that any of the device gets turned off means, then the other stock will offer invigorates to run the deactivate device with the assistance of micro controller [5]. In industries, while running countless electrical devices there is an opportunity for happening power lack [6]. Because of power lack and request the device can't work as expected. Henceforth this current system doesn't have successful answer for defeat this issue [7, 8].

2. Methodology:

The development and plan of automatic switching gear to stay away from voltage vacillation in industries. In this undertaking, the devices are connected with isolated power supply sources. The current Transformer are utilized to detect the current status of the devices and the

detected qualities are moved to the PIC controller unit. At whatever point the power vacillations happen in the LOAD'S ,the Controller has capacity to make the load as in running condition persistently. In the event that the power vacillations happen in LOAD1,the controller screens the status and, it kills the power source 1 utilizing DPDT switch. Again it turns ON the DPDT switch for making the LOAD1 ON; here the LOAD1 gets the power from the power source

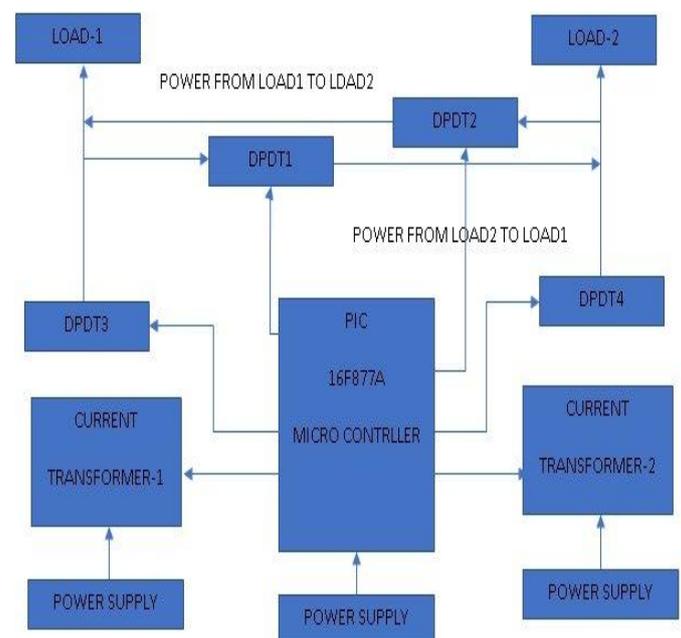


Figure 1: Block diagram of proposed system.

At whatever point the power change happens in the loads, the controller has the capacity to make the load as in running condition; on the off chance that the power vacillation Occurs in load1, the controller screens the status and, it turn OFF the power source utilizing DPDT switch3. Again it turn ON the DPDT switch2 for making the load1 ON; Then the load1 gets the power from Power source2 or if the power change happens in load2, the controller screens the status and afterward it turn OFF the power source1 utilizing DPDT switch4. Again it turn ON the DPDT switch1 for making the load2 ON; Then the load1 gets the power from Power source1. At the ordinary condition load1 and load2 gets supply from their Own power supply. By through this, the constant interaction will be keep up.

HIGH-PERFORMANCE RISC CPU

Just 35 single-word instructions to learn, All single-cycle instructions aside from program branches, which are two-cycle, Operating speed: DC - 20 MHz clock input DC - 200 ns instruction cycle, Up to 8K x 14 expressions of Flash Program Memory, Up to 368 x 8 bytes of Data Memory (RAM), Up to 256 x 8 bytes of EEPROM Data Memory, Pinout viable to other 28-pin or 40/44-pin PIC16CXXX and PIC16FXXX microcontrollers

Power supply

The power supply area is the significant one. It ought to convey steady yield controlled power supply for effective working of the task. A 0-12V/1 mA transformer is utilized for this reason. The essential of this transformer is connected in to principle supply through on/off switch and wire for shielding from overload and short out insurance. The auxiliary is connected to the diodes to change 12V AC over to 12V DC voltage. What's more, sifted by the capacitors Which is additionally managed to +5v, by utilizing IC 7805.

Bridge rectifier

At the point when four diodes are connected as demonstrated in figure, the circuit is called as bridge rectifier. The contribution to the circuit is applied to the slantingly inverse corners of the network, and the yield is taken from the leftover two corners. Allow us to accept that the transformer is working appropriately and there is a positive potential, at point An and a negative potential at point B. the positive potential at point A will advance predisposition D3 and opposite inclination D4. The negative potential at point B will advance inclination D1 and opposite D2. As of now D3 and D1 are forward one-sided and will permit current stream to go through them; D4 and D2 are converse one-sided and will hinder current stream. The way for current stream is from point B through D1, up through RL, through D3, through the auxiliary of the transformer back to point B. this way is indicated by the strong bolts. One-half cycle later the polarity across the optional of the transformer opposite, forward biasing D2 and D4 and converse biasing D1 and D3. Current stream will presently be from point A through D4, up through RL, through D2, through the auxiliary of T1, and back to point A. This way is indicated by the wrecked bolts. Waveforms (3) and (4) can be seen across D2 and D4. The current move through RL is consistently in a similar direction. In moving through RL this current builds up a voltage comparing to that shown waveform (5). Since current moves through the load (RL) during both half cycles of the applied voltage, this bridge rectifier is a full-wave rectifier. One bit of leeway of a bridge rectifier over a regular full-wave rectifier is that with a given transformer the bridge rectifier creates a voltage yield that is almost twice that of the customary full-wave circuit

IC voltage Regulators

Voltage controllers contain a class of broadly utilized ICs. Controller IC units contain the hardware for reference source, comparator amplifier, control device, and overload assurance all in a solitary IC. IC units give guideline of either a fixed positive voltage, a fixed negative

voltage, or a customizably set voltage. The controllers can be chosen for activity with load currents from many plant amperes to several amperes, relating to power appraisals from milli watts to several watts

Three Terminal Voltage Regulators

The fixed voltage controller has an unregulated dc input voltage, V_i , applied to one info terminal, a directed yield do voltage, V_o , from a subsequent terminal, with the third terminal connected to ground. For a chose controller, IC device specifications list a voltage range over which the information voltage can differ to keep a managed yield voltage over a scope of load Current. The specifications likewise list the measure of yield voltage change coming about because of an adjustment in load current (load guideline) or in information voltage (line guideline)).

DPDT-double pole-double throw

A relay is an electrically worked switch. Current coursing through the coil of the relay makes a magnetic field which draws in a lever and changes the switch contacts. The coil current can be on or off so relays have two switch positions and most have twofold toss (changeover) switch Contacts as demonstrated in the graph. Relays permit one circuit to switch a second circuit which can be totally discrete from the first. For instance a low voltage battery circuit can utilize a relay to switch a 230V AC mains circuit. There is no electrical connection inside the relay between the two circuits, the connection is magnetic and mechanical. The coil of a relay passes a generally enormous current, typically 30mA for a 12V relay, yet it very well may be just about as much as 100mA for relays intended to work from lower voltages. A pair of on-on switches which work together (appeared by the spotted line in the circuit image). A DPDT switch can be wired up as a turning around switch for a motor. A couple of on-on switches which work together (appeared by the specked line in the circuit symbol). A DPDT switch can be wired up as a turning around switch for a motor.

Incandescent lamp

The incandescent light bulb, incandescent light or incandescent light globe is a wellspring of electric light that works by incandescence. An electric current goes through a flimsy filament, warming it to a temperature that produces light. The encasing glass bulb contains either a vacuum or a latent gas to forestall oxidation filament. Incandescent bulbs are additionally now and then called electric lights, a term likewise applied to the first curve lights

LED (Light Emitting Diode)

LED is likewise most significant segment of this undertaking. Since by this no one but we can distinguish the predefined yield will enact or not. The ordinary LED will be worked by +1.5v. but we utilized +5v Power Supply. For working LED, some estimation of resister Connected between anode of the LED and +5v. At that point LED is sparkle relies on signal.

Current transformer

Current Transformer is utilized to gauge the current stream in the circuit. In this venture, the current Transformer connected between the phase supply of the two load separately. the deliberate current is send to the microcontroller IC. The MC changes analog over to digital signal. Simply by getting signal from the current transformer, the Microcontroller choose trip or initiate the relay to stream of the stock from LOAD1 to LOAD2 or from LOAD2 to LOAD1 O-5 An ammeter range.

Diode function

Diodes permit electricity to stream in just a single direction. The bolt of the circuit image shows the direction in which the current can stream. Diodes are the electrical form of a valve and early diodes were really called valves.

Forward Voltage Drop

Electricity goes through a little energy pushing its way through the diode, rather like an individual pushing through an entryway with a

spring. This implies that there is a Small voltage across a leading diode, it's called the forward voltage drop and IS about 0.7V for all ordinary diodes which are produced using silicon. The forward Voltage drop of a diode is practically consistent whatever the current going through the diode so they have an exceptionally steep characteristic (current-voltage chart).

Reverse Voltage

At the point when a converse voltage is applied an ideal diode doesn't direct, yet all genuine diodes release an exceptionally small current of a couple of uA or less. This can be overlooked in many Circuits since it will be a lot of more modest than the current streaming in the forward direction. However, all diodes have a greatest converse voltage (50V or more) and if this is surpassed the diode will fizzle and pass a huge current in the opposite direction, this is called breakdown

Electrolytic Capacitors

Electrolytic capacitors are enraptured and they should be connected the right path round, at any rate one of their leads will be checked + or - They are not harmed by heat soldering. There are two plans of electrolytic capacitors; axial where the leads are connected to each end (220uF in picture) and radial where the two leads are at a similar end .Radial capacitors will in general be somewhat more modest and they stand upstanding on the circuit board. It is not difficult to track down the estimation of electrolytic capacitors since they are obviously printed with their capacitance and voltage rating. The voltage rating can be very low (6V for ex) and it ought to consistently be checked while choosing an electrolytic capacitor. In the event that the undertaking parts list doesn't determine a voltage, pick a capacitor with a rating which is more prominent than the venture's power supply voltage. 25V is a reasonable least for most battery circuits..

ULN 2003A

The seven NPN Darlington connected transistors in these arrays are appropriate for driving lights, relays, or printer hammers in an assortment of mechanical and customer applications. Their high breakdown voltage and inside concealment diodes protect independence from issues related with inductive loads. Pinnacle inrush currents to 500 mA grant them to drive incandescent lights. The ULx2003A with a 2.7 k arrangement input resistor is appropriate for systems using 5.0 V TTL or CMOS Logic.

3. CONCLUSION

The concise subtleties of our task " AUTOMATIC SWITCHING GEAR SYSTEM FOR AVOIDING VOLTAGE FLUCTUATION IN POWER PLANT" has been given previously. This venture will be applicable for most industries and labs.

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