

Controlling Water Pump Machine Using Cellular Mobile Telephony

Subrata karmoker, Kazi Shamsul Arefin and A. S. Zaforullah Momtaz

Abstract—by using traditional individual cellular mobile telephony we now a day's get a lot of facilities. The facilities are increasing day by day by new inventions and utilization of those inventions by scientists and engineers world-wide. In this paper a broad discussion of a Mobile Phone Controlling Water Pump Machine is discussed in perspective of Bangladesh. It also attempts to discuss about how various mobile phone users can easily control a particular water pump machine as per their needs from any kinds of distance.

Index Terms—Microcontroller ATMEGA 16, Nokia 1600 mobile phone, 5 Volt Relay, Water Pump.

1 INTRODUCTION

In our country we face a common trouble of water although we badly need water supply for various purposes. In the buildings containing water roof tank and water pump for pumping water from any kind of ground level water source into the water roof tank, we can easily control the water pump machine in a very cheap and easy process. This project is more suitable in the buildings which have several levels containing many water taps, latrine water flashes, bath showers and water-heaters etc. Some times we fall in trouble when water supply is disrupted because of empty water tank. Then by calling through a mobile phone to a phone number we can start the water pump motor and also can stop it when the water roof tank becomes fulfill.

2 DESCRIPTION OF OUR PROPOSED DEVICE SYSTEM

This is a microcontroller based electrical system.

2.1 Machinery Material

In our proposed system we need a water pump machine with the horse power amount varies as per needed.

2.2 Electronic and Electrical Materials

In our proposed system we need a Microcontroller ATMEGA 16, one Nokia 1600 mobile phone set and 5volt Relay.

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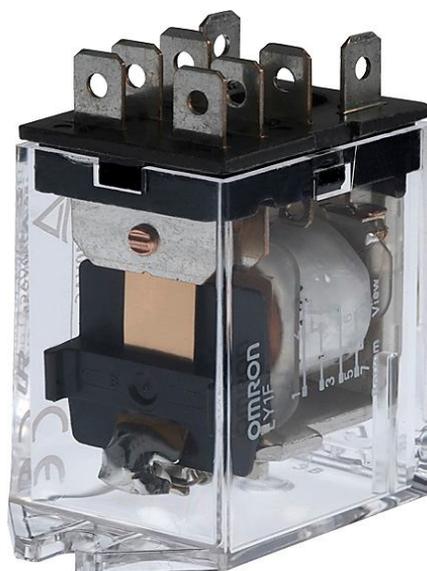


Fig. 1. 5 Volt Relay

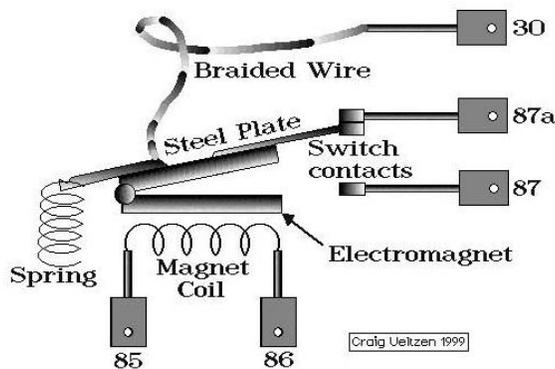


Fig. 2. Relay Switching System

2.3 The ATmega16 Microcontroller

A microcontroller often serves as the “brain” of a mecha-tronic system. Like a mini, self-contained computer, it can be programmed to interact with both the hardware of the system and the user. Even the most basic microcontroller can perform simple math operations, control digital outputs, and monitor digital inputs. As the computer industry has evolved, so has the technology associated with micro-controllers. Newer microcontrollers are much faster, have more memory, and have a host of input and output features that dwarf the ability of earlier models. Most modern controllers have analog-to-digital converters, high-speed timers and counters, interrupt capabilities, outputs that can be pulse-width modulated, serial communication ports, etc.

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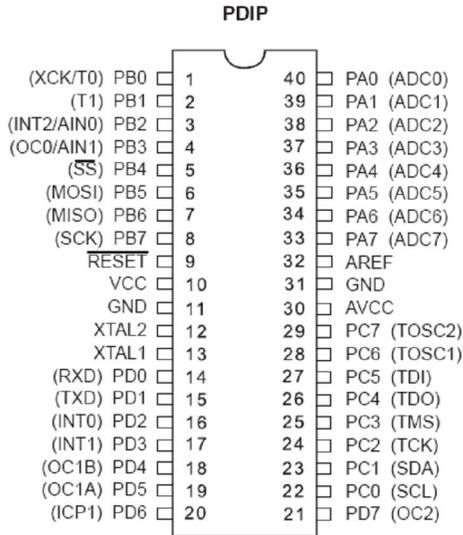


Fig. 3. ATmega16 Pin-out Diagram.

TABLE 1
PIN DESCRIPTION OF ATMEGA 16

Pin Number	Description
1	(XCK/T0) PB0
2	(T1) PB1
3	(INT2/AIN0) PB2
4	(OC0/AIN1) PB3
5	(SS) PB4
6	(MOSI) PB5
7	(MISO) PB6
8	(SCK) PB7
9	RESET
10	VCC
11	GND
12	XTAL2
13	XTAL1
14	(RXD) PD0
15	(TXD) PD1
16	(INT0) PD2
17	(INT1) PD3
18	(OC1B) PD4
19	(OC1A) PD5
20	(ICP1) PD6
21	(OC2) PD7
22	(SCL) PC0
23	(SDA) PC1
24	(TCK) PC2
25	(TMS) PC3
26	(TDO) PC4
27	PC5 (TDI)
28	PC6 (TOSC1)
29	PC7 (TOSC2)
30	AVCC
31	GND
32	AREF
33	PA7 (ADC7)

34	PA6 (ADC6)
35	PA5 (ADC5)
36	PA4 (ADC4)
37	PA3 (ADC3)
38	PA2 (ADC2)
39	PA1 (ADC1)
40	PA0 (ADC0)



Fig. 4. Atmega 16 Microcontroller

Microcontroller understands only digital language. However, the inputs available from the environment to the microcontroller are mostly analog in nature, i.e., they vary continuously with time. In order to understand the inputs by the digital processor, a device called Analog to Digital Converter (ADC) is used. As the name suggests this peripheral gathers the analog information supplied from the environment and converts it to the controller understandable digital format, microcontroller then processes the information and provides the desired result at the output end.

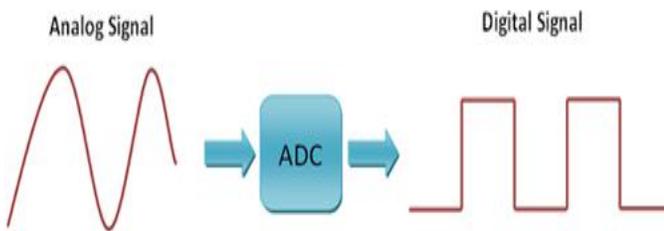


Fig. 5. ADC System

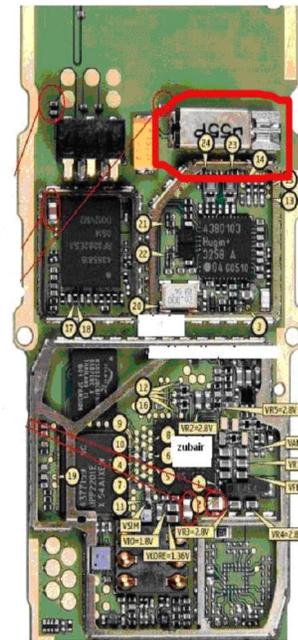


Fig. 6. Mobile Circuit Board



Fig. 7. Mobile Vibration Motor

3 WORKING PROCEDURE

At first we need to write a code for the microcontroller. When we have to give a phone call to the system mobile phone Nokia 1600 then we will get an output from the mobile vibration motor. This output voltage will go to the Microcontroller ADC pin as an input. When we give 1 call to the system mobile phone then the vibration motor will give 4 times output repeatedly. This output will go to Microcontroller as an input and for 4 times inputs Microcontroller give an output to the output pin. This output will go to the Relay and the Relay switch will be on. Then the motor will start to pump water. Again when we give a call to the circuit mobile phone then the input go to the Relay then the Relay switch will be off and as a result the motor will stop

pumping water.

In case of any problem such as we start pump machine and we fail to give a call for stopping the pump machine, we can use an extra switch to stop the machine. This switch will be connected before Relay switch. So at first the supply goes to the extra switch and go to relay. For relay switch control we can use another switch which can control 5 volt DC supply for regulating relay switch and as a result if we face any problem with this system we can control it by the extra switch.

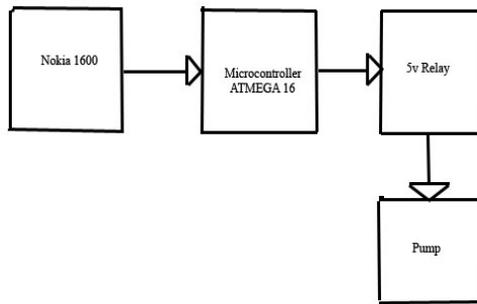


Fig. 8. Block Diagram of the System

The number users will be saved in the system mobile phone set by specific ring-tones which will be activated the vibrator and then the water pump will be start or stop pumping water. If any call comes from unsaved numbers then a specific ring-tone will be played which deactivate the vibrator and thus the water pump will not be start or stop pumping water.

4 LIMITATIONS

- a. System mobile phone battery must be charged all the time
- b. System mobile phone connection must be valid all time
- c. The mobile operator company network must have the area under service for the system mobile phone
- d. The mobile operator company network must have strength enough to keep the system mobile phone out of network disturbs.

5 RECOMMENDATIONS

We have to think about multi person users calling at the similar time how it will be controlled. The users have to facility enough to know that the water roof tank must not overflow. They must have the facility enough to know the water supply from the ground level sources to the water pumping motor. If any user lost his/ her own mobile phone in which the system mobile phone number is saved may have the automatic system while communicate the system mobile phone set when he/ she will manage a new mobile phone set.

6 CONCLUSION

Our proposed device is a locally designed and developed system. One innovative and effective idea can change a nation. We are now towards the goal to give the people life more comfortable and easy. Another name of the water is life. In this system we are trying to give people water supply more easier.

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