# Garbage Aqua Cure Practise Oversee Adopting GSM

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## ABSTRACT

*Nowadays enormous volume of untreated water gets discharged as sewage and industrial wastes and we need treated sewage water due to scarcity. It pollutes the water bodies and the fresh water sources, so it is to be treated and recycled. During this process microorganisms are removed from sewage as organic matter. In order to reduce the man power from monitoring and maintain STP, it is fully automated to check PH, TDS and Quality chemical dosage reading in every 2 hour status updated by SMS. It sends a Warning alert for increase and decrease in Reference Level and Power cut / Power in Time status alert by SMS to the workers.*
*Keywords: Atmel-328 Microcontroller, Relay Driver circuit, Solenoid valve, TDS sensor, pH sensor, Real time clock.*

## 1. INTRODUCTION:

This is fully automated to monitor the sewage treatment process. Readings such as pH, TDS and chemical dosing are automatically monitored and every two hours it is updated and also sends SMS to the computer. Status time for Power cut and Power On are alerted by SMS, Input level and Output level of STP plant are stored to the computer and the problems due to power cut are reduced. The maximum permitted concentration level of phenol being 0.5-1 mg/l for industrial wastewater and 1µg/l for drinking water. So it is highly essential to save the water resources and aquatic life by removing these compounds from wastewater before disposal. A sewage treatment plant is necessary to receive the domestic and commercial wastes and removes the materials which pose harm for public. Its main objective is to produce an environmentally-safe fluid waste stream and a solid waste suitable for disposal or reuse.
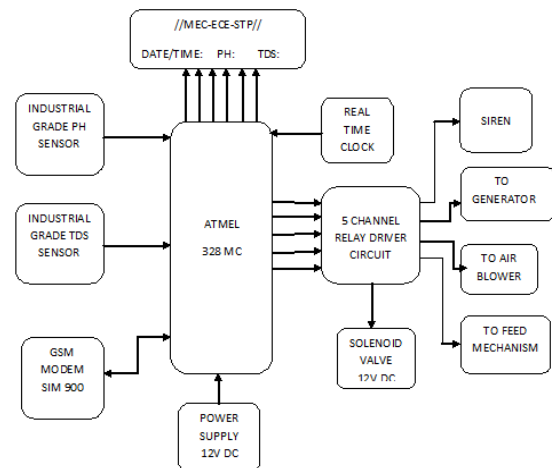
## 2. BLOCK DIAGRAM:



**Fig.2.1 Block diagram of STP**

This intent has industrial grade PH and TDS sensor with the help of GSM modem, Every one hour the SMS will be pushed with the following values pH, TDS, Power ON/OFF, Date & Time. The embedded coding in Atmel 328 microcontroller to control the siren during power cut and switch on the generator automatically with the help of Relay. Solenoid Valve to get new samples for every 30 minutes.

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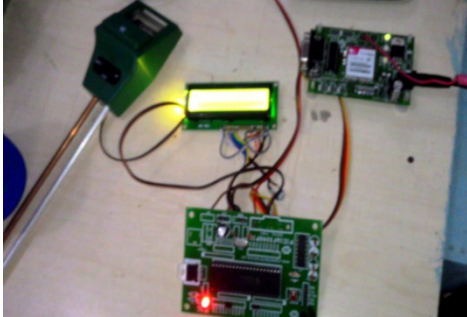
## 3. PROTOTYPE MODULE:









**Fig.3  Prototype Module**

### 3.1 ATMEL 328 MICROCONTROLLER:

**Atmel328**: Brain of this project is Atmel-328micro-controller. It is a 8 bit Micro controller with advanced RISC architecture. Atmega328 Microcontroller has 6-channel ADC in PDIP package. It has 23 programmable i/o lines. It has two 8-bit Timer/Counter with separate prescaler, compare mode and one 16-bit Timer/Counter with separate prescaler, compare mode and capture mode. It has programmable serial USART and has Master/Slave SPI serial interface. It has on-chip Analog comparator.
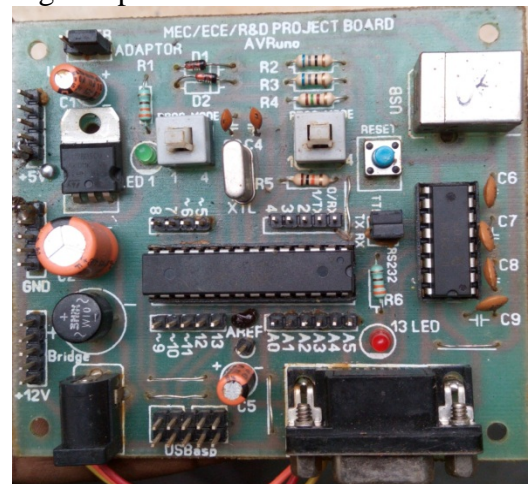


**Fig.3.1    ATMEL 328 Microcontroller**

### 3.2 GSM MODEM SIM 900:

Sim900 has been used as GSM module. SIM900 module is a complete Quad-Band GSM/GPRS module which combines GPS technology for satellite navigation. The compact design which integrated GPRS and GPS in a SMT package will significantly save both time and costs. Power consumption (GSM engine in sleep mode) around 1.5mA and Power consumption (GSM engine in idle mode) around 77mA .

**Fig.3.2  GSM Modem SIM 900 Module**

### 3.1  LCD DISPLAY:



**Fig.3.3    LCD Display**

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data. The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD.

### 3.2  RELAY DRIVER CIRCUIT:

A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid state relays. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal.
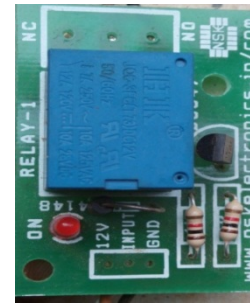


**Fig.3.4    Relay Driver Circuit**

A type of relay that can handle the high power required to directly control an electric motor or other loads is called a contractor. Solid state relays control power circuits with no moving parts, instead using a semiconductor device to perform switching. Relays with calibrated operating characteristics and sometimes multiple operating coils are used to protect electrical circuits from overload or faults; in modern electric power systems these functions are performed by digital instruments still called "protective relays".

### 3.3    SOLENOID VALVE:



**Fig.3.5  Solenoid valve**

A solenoid valve is an electromechanically operated valve. The valve is controlled by an electric current through a solenoid: in the case of a two-port valve the flow is switched on or off; in the case of a three-port valve, the outflow is switched between the two outlet ports. Solenoid valves are the most frequently used control elements in fluidics. Their tasks are to shut off, release, dose, distribute or mix fluids. They are found in many application areas. Solenoids offer fast and safe switching, high reliability, long service life, good medium compatibility of the materials used, low control power and compact design.

**4.1 PH SENSOR:**



**Fig.4.1  pH sensor**

The Stevens-Greenspan pH Sensor offers a unique combination of advanced features: Innovative, optically isolated signal conditioning electronics ensure true and accurate readings at all times. Field proven gel-filled double junction electrode provides long term accuracy. Optical isolation of signal conditioning electronics enables operation in combination with other sensors without compromising performance. Low power energy saving design enables long term operation in remote data logging applications. Optional on-board data logger with a wide range of sophisticated logging features enables long term unattended operation.

**4.1　TDS SENSOR:**



**Fig.4.2  TDS sensor**

A general purpose Conductivity/ TDS/ temperature bench meter for use in laboratory situations. The instrument includes a 32 reading memory facility. Features include: automatic range selection, calibration on standard solutions or direct cell constant entry, automatic temperature compensation, analogue output and RS232 serial interface.

**5.1  REAL TIME CLOCK:**



**Fig.5.1   Real Time Clock**

IDT real-time clocks (RTC IC) are ultra-low-power clock/date devices with programmable time-of-day alarms and programmable square-wave outputs. These devices offer high noise immunity, low current consumption, 12/24 hour mode of operation, auto correction for leap year and programmable square wave output, making them ideal for a wide range of design applications.

IDT's real-time clock ICs count seconds, minutes, hours, day, date, month, and year with leap-year compensation valid up to 2100. The devices feature normal and fast-mode I2C interfaces, two time-of-day alarms, an oscillator stop flag, programmable square-wave outputs that default to 32 kHz on power-up, and operating voltages ranging from 1.8 to 5.5V.

**5　CONCLUSION:**

We have proposed an approach of automation in STP which totally automated the maintenance work. And without human effort our module will check PH, TDS and Quality chemical dosage reading in every 2 hour status update by SMS. It will send a Warning alert for increase and decrease in Reference Level and Power cut / Power in Time status alert by SMS to the workers. Hence our project will help to reduce the problems due to power cut. Moreover Output of treated water will be nearer to 100 %

pure, more maintenance and Continuous monitoring by workers is not required.

## 7 OUTPUT:



**Fig.7.1 Power On Alert By SMS**



pH value output
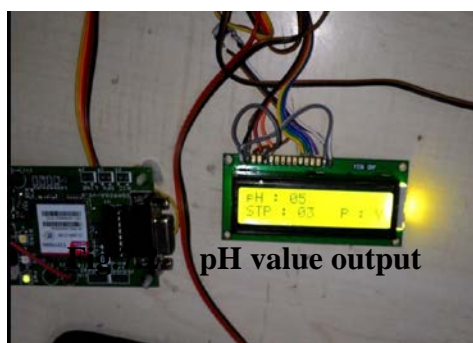
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