GPS BASED HIGH PRECISION UNIVERSAL CLOCK FOR ATOMIC LABORATORIES

Global Positioning System (GPS) satellites broadcast signals from space that GPS receivers, use to provide three-dimensional location (latitude, longitude, and altitude) plus precise time. GPS receivers provides reliable positioning, navigation, and timing services to worldwide users on a continuous basis in all weather, day and night, anywhere on or near the Earth. This ultra-sensitive GPS receiver can acquire GPS signals from 65 channels of satellites and output position data with high accuracy in extremely challenging environments and under poor signal conditions due to its active antenna and high sensitivity. The GPS receiver's -160dBm tracking sensitivity allows continuous position coverage in nearly all application environments. The output is serial data of 9600 baud rate which is standard NMEA 0183 v3.0 protocol offering industry standard data messages and a command set for easy interface to mapping software and embedded devices.

This project consists of microcontroller, GPS modem and 16X2 LCD display. This project gives exact clock which is universal. This is entirely different from normal clock. Normal real time clock may vary from place to place. But this universal clock is unique and exact clock with respective to place.GPS satellites gives this universal clock to GPS modem, these GPS modems are connected to microcontroller through serial interface. But this time or clock not in direct format, it is in NMEA format. C code extracts this format to direct format and displayed on 16X2 LCD.

In this project 7805 is a regulator and it avoids noise spikes in power supply. GPS modem is connected microcontroller through serial port. These GPS modem works under 9600 or 4800 baud rates. 16X2 LCD is connected to microcontroller through digital I/O ports.

In this prototype model step-down power supply circuit is used. First from 230Volts AC is converted as 12V AC by using a step-down transformer. Then a 1000uf capacitor is used to convert it to pure 12V DC. 7805 will convert the 12V DC supply to 5V DC along with a 100uf capacitor. This 5V DC is used for all components like microcontroller, inputs and outputs.

TECHNICAL SPECIFICATIONS:

HARDWARE:

- Micro controller : AT89S52
- Crystal : 11.0592 MHz
- LCD : HD44780
- LED : 5mm Red LED
- Serial Driver : Max 232
- GPS modem
- Power supply
- Transformer : 12V step down
- Filter : 1000uf/25V
- Voltage Regulator : 7805

SOFTWARE:

- Keil micro vision
- Proteus
- UC flash
- C# .net Application

APPLICATIONS:

- Railways
- Army
- Navy applications

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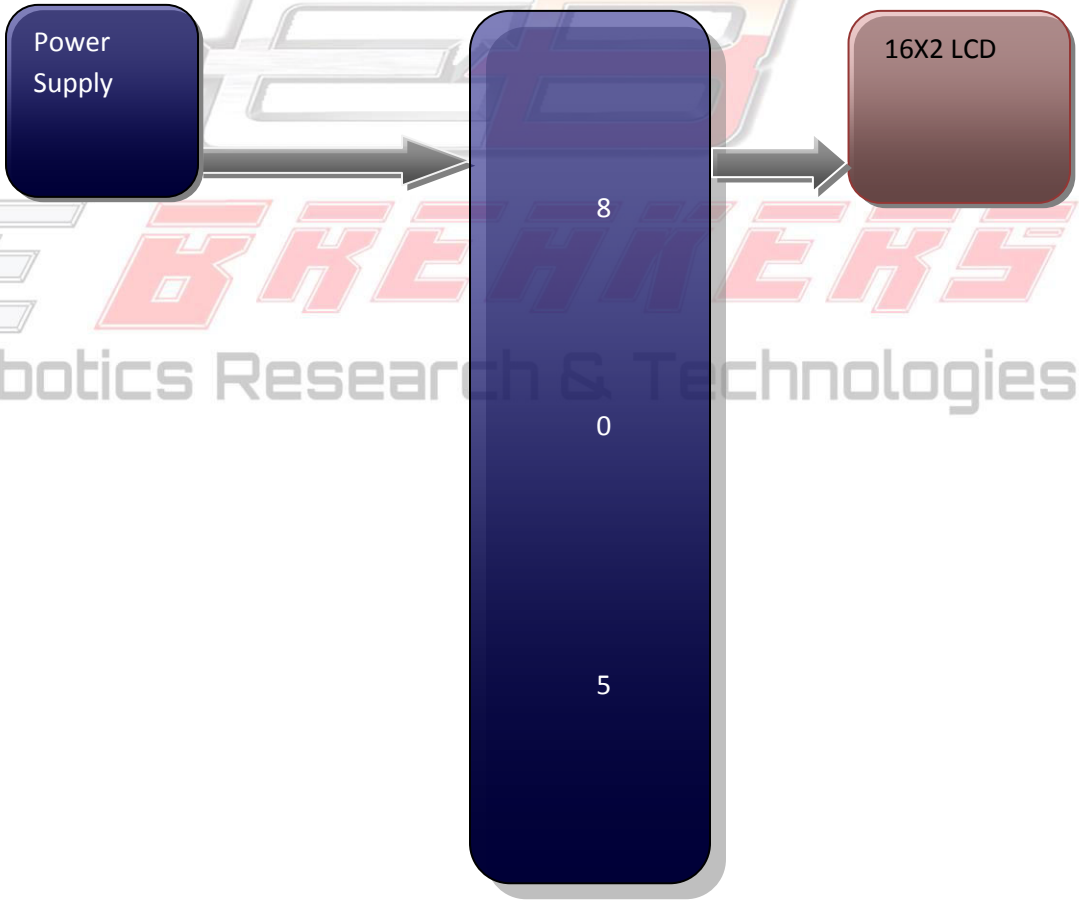
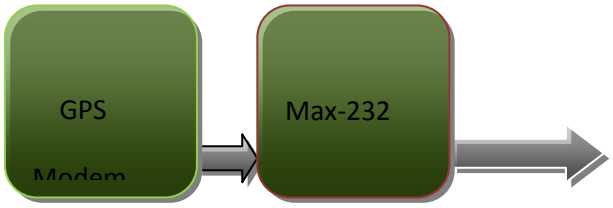
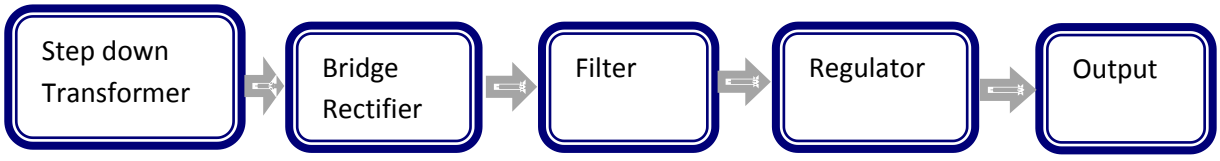
BLOCK DIAGRAM:





POWER SUPPLY BLOCK DIAGRAM

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