SMART PARKING SYSTEM

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INTRODUCTION

- A Smart Parking System to implement systematic parking.

    1. A RTC to record the time and fare of the vehicles.

    2. Reed Switches used for position sensing of the vehicles.

    3. LCD for location and Fare display.

FEATURES OF PROJECT

•Infrared sensor will sense the position of car at the entry and exit gate resulting in opening and closing of exit and entry gates automatically with the help of microcontroller and DC gear motor

•Further there will be no collision with other devices or obstacles, preventing the system (car) from any kind of damage or accidents.

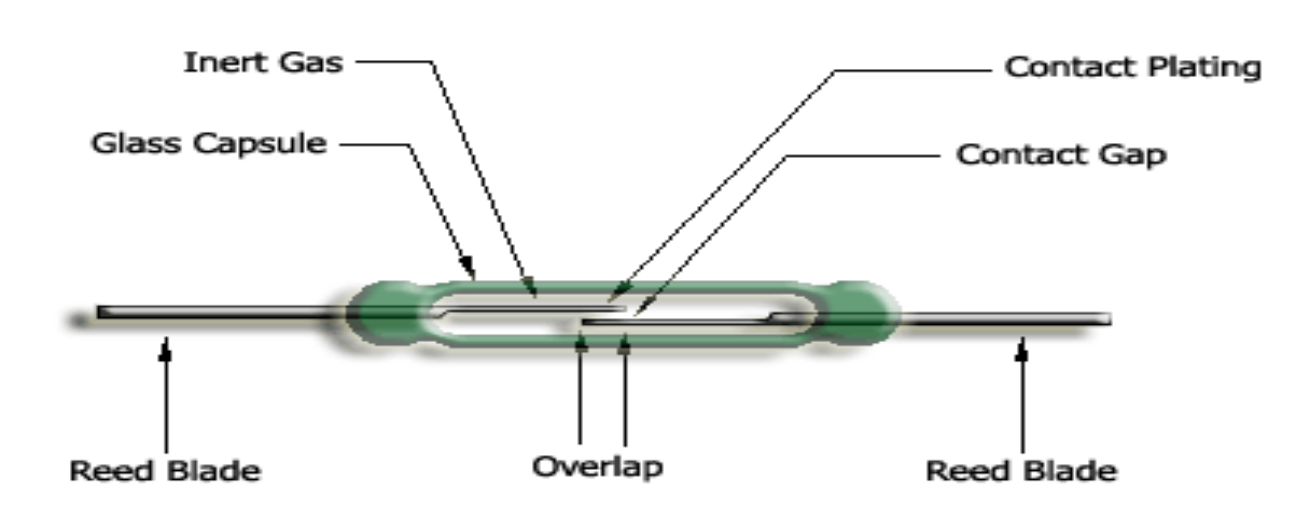
•A real-time clock (RTC) is a computer clock (most often in the form of an integrated circuit) that keeps track of the parking time.

•A 3.5V Ni-Cd battery is provided as an additional battery source if the power cut is for a long duration

•Microcontroller is so programmed as to calculate the fare of vehicles with respect to the time it is parked

•Only one vehicle (car) can enter at a time and while one is entering no car can take exit from the exit gate thus providing one vehicle at a time making the record of fare pure.

REED SWITCH



•The reed switch is an electrical switch operated by an applied magnetic field.

•The contacts may be normally open, closing when a magnetic field is present, or normally closed and opening when a magnetic field is applied.

•A magnetic field (from an electromagnet or a permanent magnet) will cause the reeds to come together, thus completing an electrical circuit. The stiffness of the reeds causes them to separate, and open the circuit, when the magnetic field ceases.

INFRARED SENSOR

•An infrared sensor is an electronic instrument that is used to sense certain characteristics of its surroundings by either emitting and/or detecting infrared radiation.

• It is also capable of measuring heat of an object and detecting motion. Infrared waves are not visible to the human eye

•Key benefits of infrared sensors include low power requirements, simple circuitry, and their portable feature

•In the electromagnetic spectrum, infrared radiation is the region having wavelengths longer than visible light wavelengths, but shorter than microwaves.

•Infrared technology is found in many of our everyday products. For example, TV has an IR detector for interpreting the signal from the remote control

•The wavelength region from 0.75 to 3μm is termed as near infrared, the region from 3 to 6μm is termed mid-infrared, and the region higher than 6μm is termed as far infrared.

RTC (REAL TIME CLOCK)

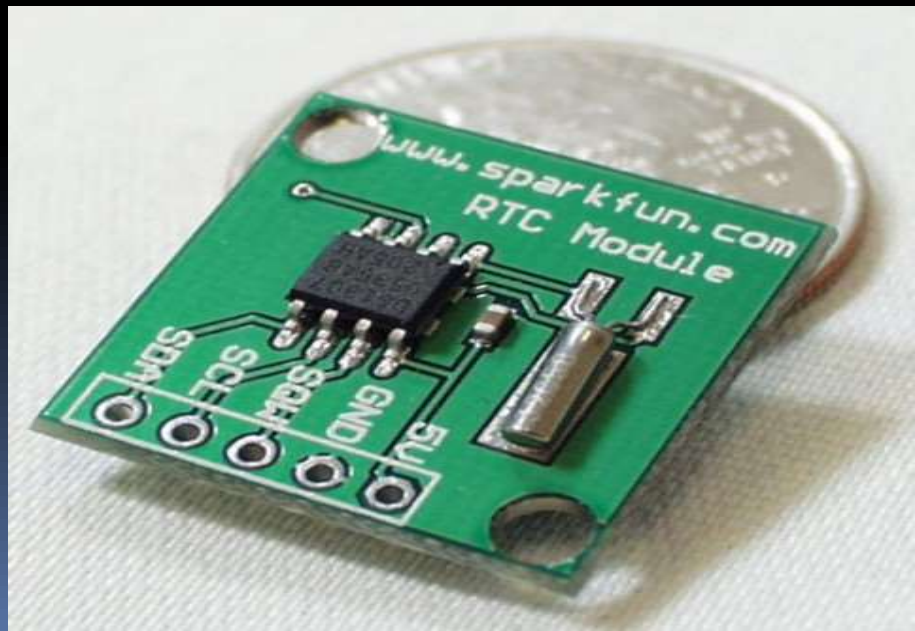
•A real-time clock (RTC) is a computer clock (most often in the form of an integrated circuit) that keeps track of the current time.

•RTCs are present in almost any electronic device which needs to keep accurate time.

•In many cases the oscillator's frequency is 32.768 kHz. This is the same frequency used in quartz clocks and watches, and for the same reasons, namely that the frequency is exactly 215 cycles per second, which is a convenient rate to use with simple binary counter circuits.

•Applications :

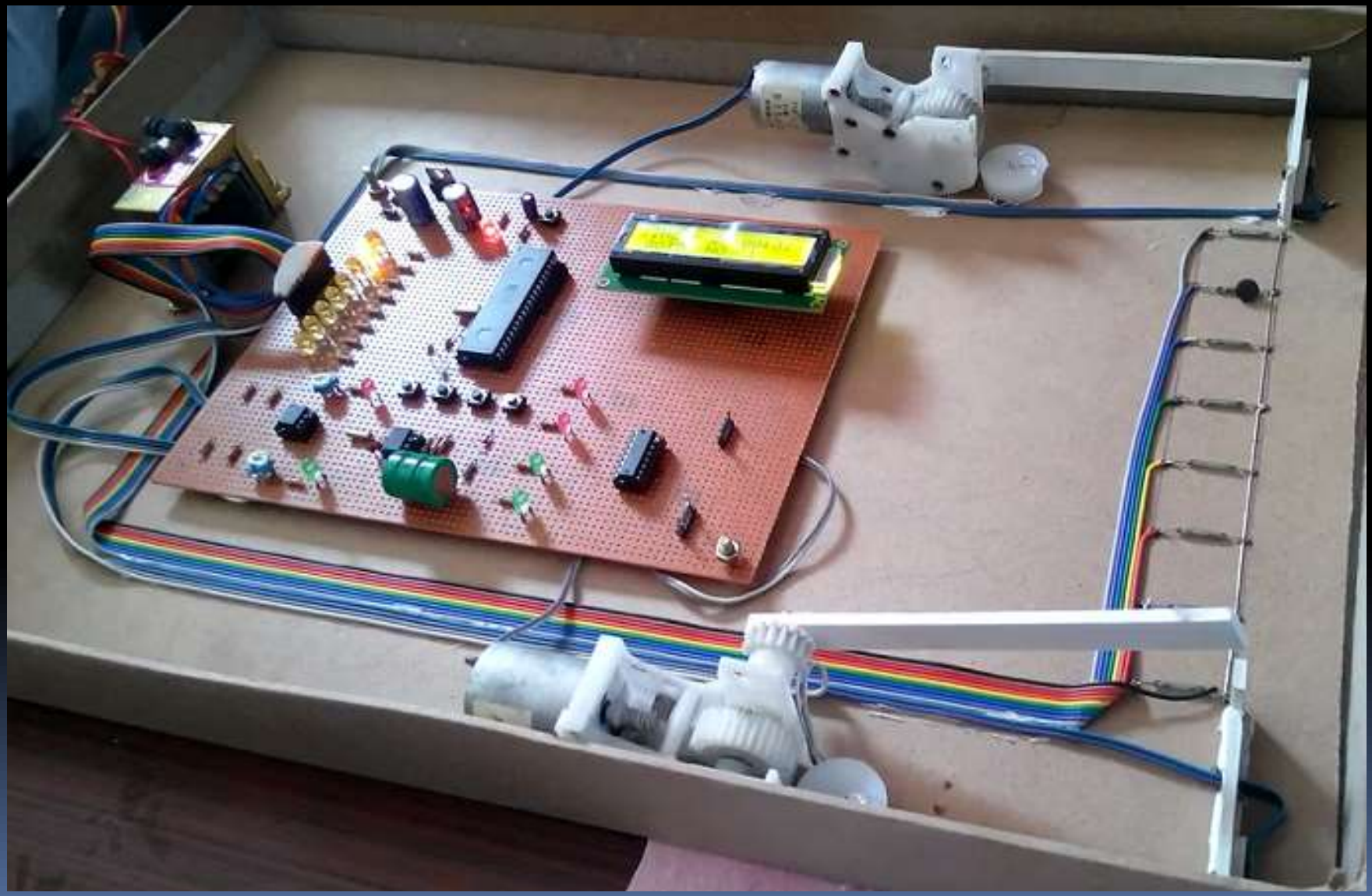
•Mobile telephones
•Portable instruments
•Electronic metering
•Battery powered products



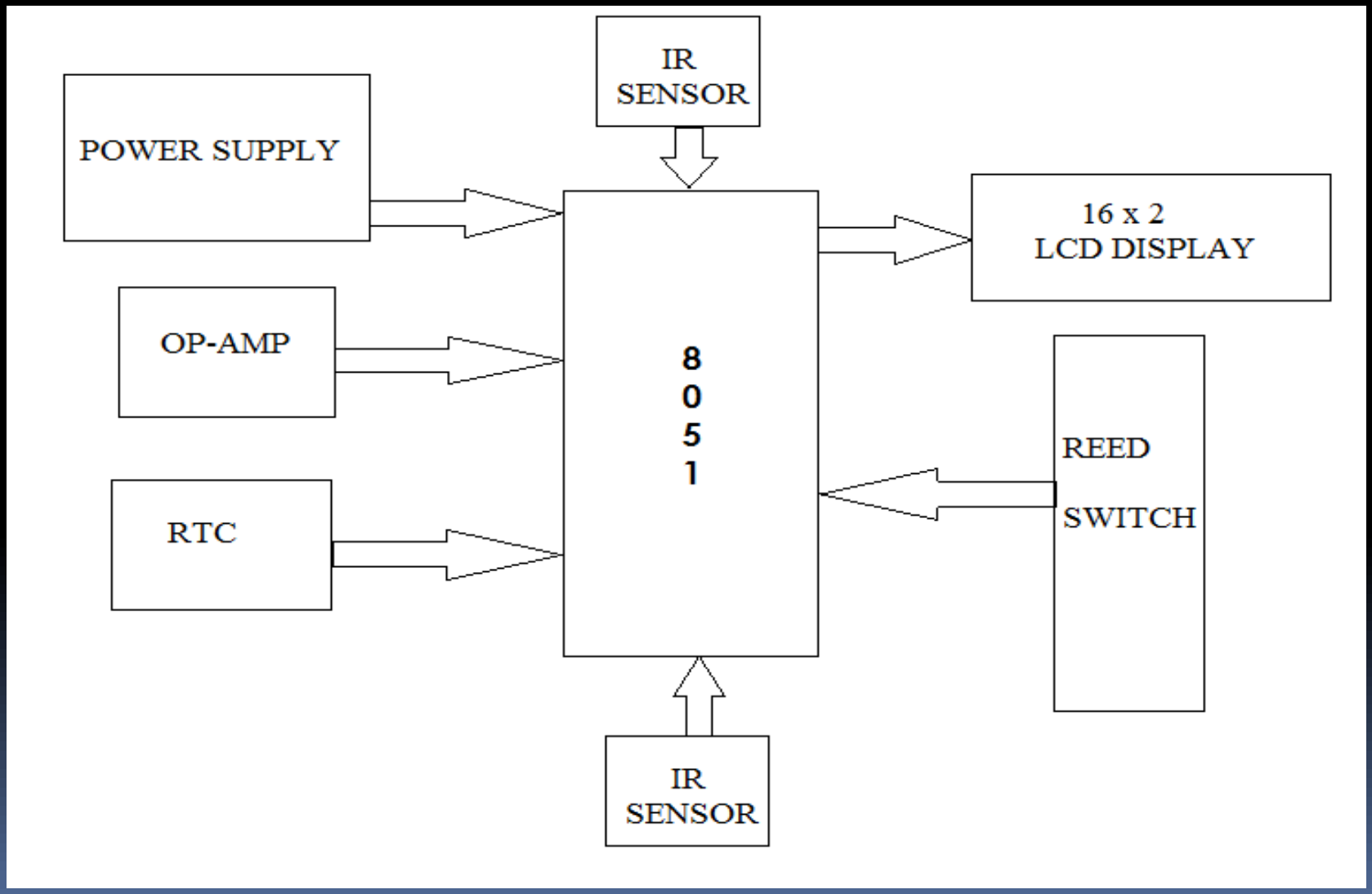
FEATURES OF RTC

- Provides year, month, day, weekday, hours, minutes and seconds based on 32.768 kHz quartz crystal
- Century flag
- Clock operating voltage: 1.8 V to 5.5 V
- Low backup current; typical 0.25 µA at VDD = 3.0 V and Temp = 25 °C
- 400 kHz two-wire I2C-bus interface (at VDD = 1.8 V to 5.5 V)
- Programmable clock output for peripheral devices (32.768 kHz, 1024 Hz, 32 Hz and 1 Hz)
- Alarm and timer functions
- Integrated oscillator capacitor
- Internal power-on reset
- I2C-bus slave address: read A3h and write A2h
- Open-drain interrupt pin
- Electro-Static Discharge (ESD) protection exceeds 2000 V Human Body Model (HBM) per JESD22-A114, 200 V Machine Model (MM) per JESD22-A115 and 2000 V
- Charged Device Model (CDM) per JESD22-C101
- Latch-up testing is done to JEDEC standard JESD78 which exceeds 100mA.

CIRCUIT DIAGRMA



BLOCK DIAGRAM



WORKING

- In Smart Parking System an Infrared sensor will sense the position of car and entry gate will open and infrared through operational amplifier will send an amplified signal to controller and controller will send empty locations on LCD and RTC will start to record the time interval of parking where reed switch will sense the position if its occupied or not forming a magnetic switch(Reed Switch).

- LED will show the status of Parking Slots.

- Whenever a car want to take exit then it will go to exit gate again the Infrared sensor will sense the position of car and send an amplified signal to controller and gate will open and again LCD will display the fare of parking duration.

APPLICATIONS

•Smart parking pilot programs are now being deployed in San Francisco, Los Angeles, Stockholm, Beijing, Shanghai, São Paulo, and the Netherlands. For example, in Los Angeles , low-power sensors and smart meters track the occupancy of parking spaces throughout the Hollywood district, one of its most congested areas.

•Users can access that occupancy data to determine the availability of spots and then pay for them with their mobile phones. In addition to lending convenience and environmental benefits, smart parking improves the utilization of existing parking, leading to greater revenue for parking owners. Los Angeles saw a return on its investment in smart parking within three months.

CONCLUSION

•The system benefits of smart parking go well beyond avoiding the needless circling of city blocks. It also enables cities to develop fully integrated multimodal intelligent transportation systems that don't rely on cars in the first place.

• Developing smart parking solutions within a city requires data standardization and management; mobile phone integration; hardware and software innovation; and coordination among various stakeholders (on and off street parking facility owners, business owners, municipalities, transportation authorities, customers, and software developers).

• These technical solutions and stakeholders are the same data structures and development groups integral to making a smart phone -enabled, multimodal, fully integrated transportation solution a reality. In effect, the technical enablers and multi-stakeholder coordination effort behind development of a local smart parking solution creates a launch pad toward full transportation system integration.

THANKS