

As described in block diagram we are using a NUVOTON controller 78E059A as a controlling device. Transformer and Bridge circuit are used in power circuit of the system. Sufficient LEDs are used for indication of different events such like one LED for power supply indication second is for PSTN line indication another two for different modes of the system. Some keys are also added for different functionality. One Key for Emergency, use of this key when shop is open and any critical situation found user can send alerts with siren. This functionality is the best in jewelers and Banks. Another key named Enable, which is used to activate a system to monitor sensors after some time. Example of this function for jewelers is, suppose Auto on time is 8.30 PM. But due to festivals shop will remain open for 10 PM. Now as the auto on time passed user have to activate the system while closing the shop. So by pressing this key system is activated manually and after some time start monitoring sensors. This system is also designed such a way during holiday system will remain in ON state though auto off time arrives. Let see how all the functionalities are achieved using controller and ICs.

B.RTC (Real Time Clock)

RTC is main part of this system because the total schedule of the system is based on it. Thus Interfacing of RTC with controller and additional circuits related to this must be too accurate. In this system DS 1307 IC is used. It is interfaced with microcontroller by I2C Bus.

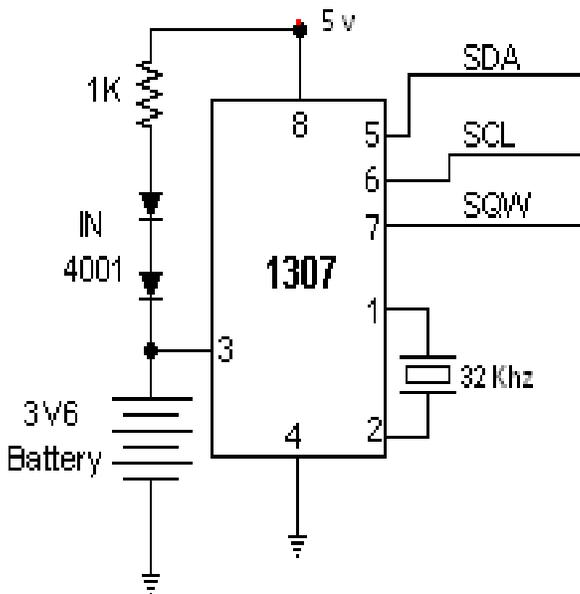


FIG 2. DS1307 INTERFACING CIRCUIT

This is 8 pin IC which requires a crystal to start counting time. In this system 32 KHz quartz crystal is connected with it. After main power off our clock must not to be stop so an additional

battery is connected to this IC. Three Pins are connected to microcontroller. By programming microcontroller we can read and write data to this IC using I2C protocol.

C.PSTN SIGNAL GENERATION:

In this system we are generating a call by PSTN line so we have to generate signals by controller which can be sense by PSTN line. In this system we are using two different ICs to do this.

- 1) Switching IC M22100
- 2) Tone/pulse dialer IL91214B

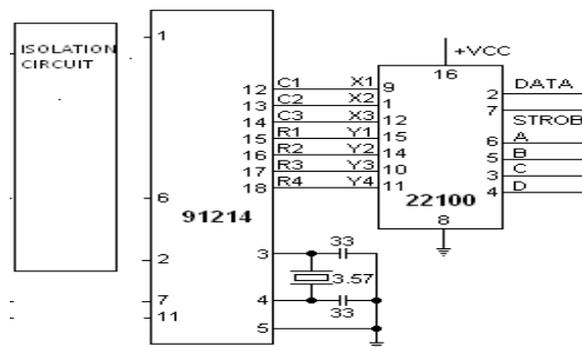


FIG 3. 91214 INTERFACING CIRCUIT WITH KEYPAD IC 22100

Keypad IC M22100 is interfaced with Microcontroller. Output of M22100 is given to the IL91214 which generates a tone according digit we want dial.

We have to provide isolation between line and system. There are two ways to provide isolation either you can use transistors, resistor based circuit or use 1:1 transformer.

D. PSTN LINE DECODING:

This is an additional functionality in this system. If service provider wants to change the flags and data from his office than he can change the flags as well as data of any system at party place. Due to that service provided need not to go any party place for minor change in system thus saving of time and expenditure.

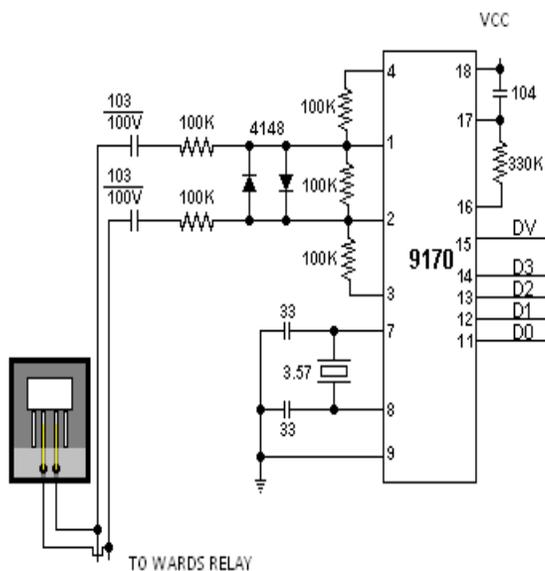


Fig. 4 9170 INTERFACING CIRCUIT

HT 9170 DTMF receiver IC used for decoding purpose. Any data from the PSTN line can be taken into controller and through controller we can place in external memory.

E. EXTERNAL MEMORY

In this system IC 24c64 is used to store flags and log data because microcontroller haven't sufficient memory to store all log data. System can store all the events in external memory like Which time and date sensors are operated, which numbers it had dialed, when emergency pressed.

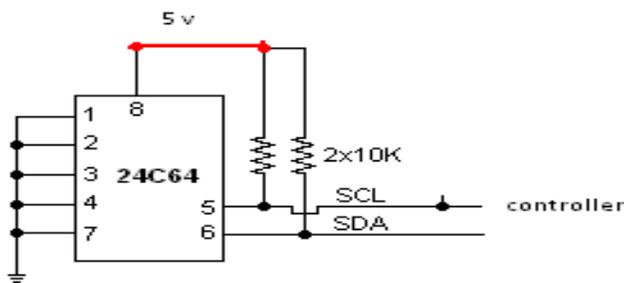


Fig. 5 24C64 INTERFACING CIRCUIT

F.OUTCOMES

We can monitor total system in HyperTerminal by connecting the system to PC via serial port. At the party place LEDs indicates all the states

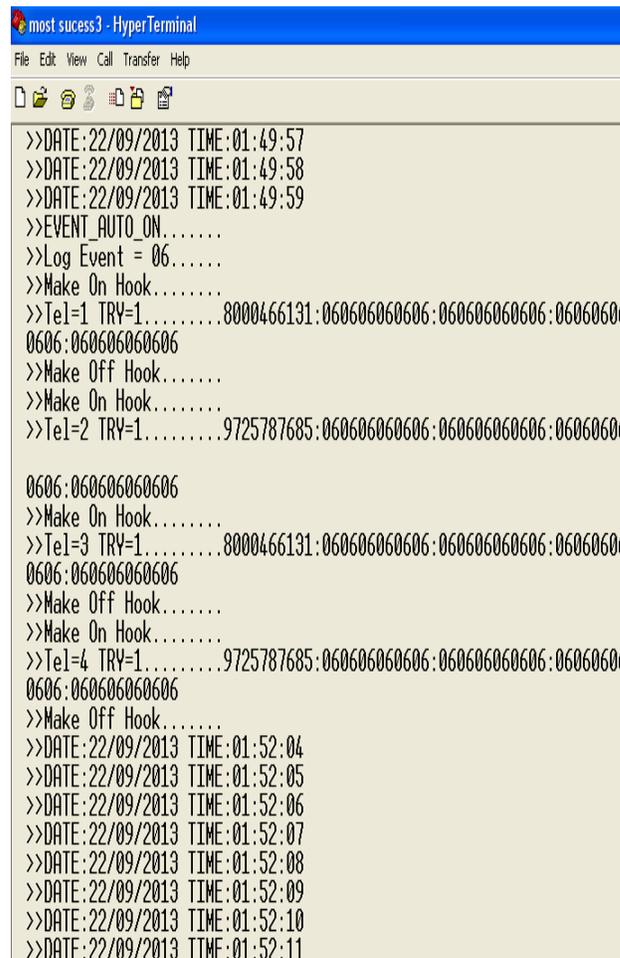


FIG 6. OUTPUT OF SYSTEM IN HYPERTERMINAL

IV.CONCLUSION

Some additional functionality we can add to this system is when the ac power will off than siren will sound and during this time power is applied by additional battery backup. Using the GSM modem we can also send SMS to users with daily report. Also service provider can prepare a GUI in visual basic and monitor all the system which he has installed. At present this system has sufficient Features and providing best security.

REFERENCES

PDFs:

- [1] HOLTEK HT9170 DTMF receiver datasheet.
- [2] DS1307/DS1308 64 X 8 Serial Real Time Clock datasheet by Dallas semiconductor.
- [3] IL91241 tone/pulse dialer datasheet by IK semiconductor.
- [4] Nuvoton 8-bit 8051-based Microcontroller N78E059A/N78E055A Data Sheet

Working platform:

- [1] NSIT Jetalpur, Ahmedabad
- [2] SIL Ahmedabad