

# IVR SYSTEM for Industrial Control

## Security & Control Through IVR

Prof. Adhikrao Patil

Department of Electronics & Telecommunication  
Engineering (ExTC), University Of Mumbai  
Vishwatmak Om Gurudev College Of Engineering  
Maharashtra State Highway 79, Mohili, Maharashtra  
421601, India.  
mrudulnambiar@gmail.com

Mrudul Nambiar, Deepak Chormare

Department of Electronics & Telecommunication  
Engineering (ExTC), University Of Mumbai  
Vishwatmak Om Gurudev College Of Engineering  
Maharashtra State Highway 79, Mohili, Maharashtra  
421601, India.  
dchormare@gmail.com

**Abstract**—Industrial machineries & high cost device safety and control id big problem for companies now days. This challenging problem has to be mentioned last few years. IVR system is the best solution of challenging problems still there is no such device or technique which control and make secure the machines & devices. This paper presents a technique for IVR system for industrial control. It will help us to secure high cost machines also we can operate (ON/OFF) the Industrial machines & other Devices by using our interactive voice response (IVR) Systematically. The main advantage of this technique is it can Operate from anywhere and low requirements, in terms of speed, accuracy and memory utilization. The goal is to implement the IVR system to control, security & maintenance of high costly industrial machineries and real time overview control on machines or devices.

**Keywords**—password verification, service provdes, auto control & security

\*\*\*\*\*

### I. INTRODUCTION

IVR System is widely used now a day in lots of application. It offer high speed operation, low maintenance, better security The wireless transmitting device like mobiles can use in it for controlling the devices & machineries from anywhere you are. Industrial companies called Smart industrial companies only if it works much more on their automated system than the human working system. Taking one step further towards the security system of Industry we are proposing this project to you. It will help us to secure high cost machines; also we can operate (ON/OFF) the Industrial machines & other Devices by using our interactive voice response (IVR) System.

The advancement in the field of Interactive Voice Response (IVR) systems has fascinated us in doing this project. And there are some sensors on the device which will notify the live status of the device also it control itself in auto mode.

The problem is occur when set limits of the sensors are exceeded by the device it will notify to us and we can shut down or on/off our device A generic representation of system is shown in Fig. 1.

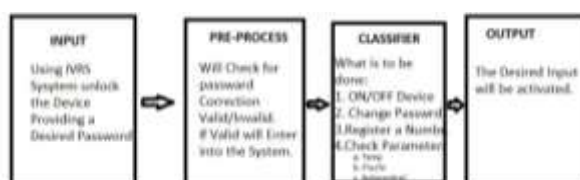


Fig. 1. Generic representation of IVR system

When you call the system first ask password if password is verified if it is valid entered in system then provide some option which stored in prerecorded voice & in the sensors like heat sensor. It measure the Temperature if temperature reach beyond the safety limit then it notify to us two or three times you don't give response then it will automatically turn of the machine or device. This is the best part of Our IVR System for industrial control.

### II. METHOD

Now, we will see procedure in detail by specifying it into three different parts.

#### 1. System Registration

1. Acquire to register the user with legal information.
2. The user set the password to the system and keep it secret. Without this password user unable to entered in the system.
3. User need to set the all requirement of the system then it is ready to use.

#### 2. SYSTEM PROCESS

1. User make the request to system to using IVR system unlock the device.
2. System ask to user to provide a password. Then user need to provide the password to entered into a system.

3. To check and verified the password provided by the user. If it is valid then it allow to user entered in the system. Otherwise it decline the request.

### System features

When you entered in the system then system gives user some response in the form of voice message. Which message already stored in the system and user select the option by pressing the keys provided by the dual tone multi-frequency keyboard (DTMF).Then system gives the further options like as follows;

1. To turn on/off the machine or device
2. To check the parameters
3. Change the password
4. Register a number

If we select the 1<sup>st</sup> option then system asked following: if you want on the machine then press 1 or if you want turn off the machine then press 2 as per the user request system will perform the operation it will on or off the system.

If we choose 2<sup>nd</sup> option then system asked following: If you want to check the temperature of the machine then press 1, if you want to check current flow then press 2, an you want make system in auto mode ten press 3. If select 1 then gives the information about the temperature of the machine device then also it will check behind the process and notified you if it reached the safety limit. if exceeded the limit then it will off the machine automatically. If you choose the 2<sup>nd</sup> then it gives the information about current supply of the system. It will check the steady current flow. If it is not steady then it will turn off the system. When you press the 3<sup>rd</sup> option then system will goes in auto mode. For the input through the keyboard the operation will perform as follow dialed no Operation

Relay RL2 is a dial relay it,s contacts are in series with the telephone line. Contact make break is the principle of dialing , as it was used in olden days with round dial type telephone hand sets., if you want to dial '5' just break the contacts 5 times. To dial '9' break the contact 9 time. Similarly for all the numbers, to dial '0',you will have to break the contact ten times. This type of dialing is known as pulse dialing. By making breaking the contacts we send the series of pulses to exchange, there should be atleast one second gap between two numbers. Dial relay is driven by pin P1.6 through R28 and Q2.

If choose the 3<sup>rd</sup> option for then system asked you to change the password. then system will asked for current password. If this password is correct then asked for new password. You provide the new password by pressing the keys on the keyboard. Then it gives you conformation of the password will change.

In order to increase the flexibility or Security IVR System we used the microcontroller in it. Also in this system we can

used another parameters in future scope of the IVR system for the industrial control. Just like it can be used in the to maintenance of the school or any government office.

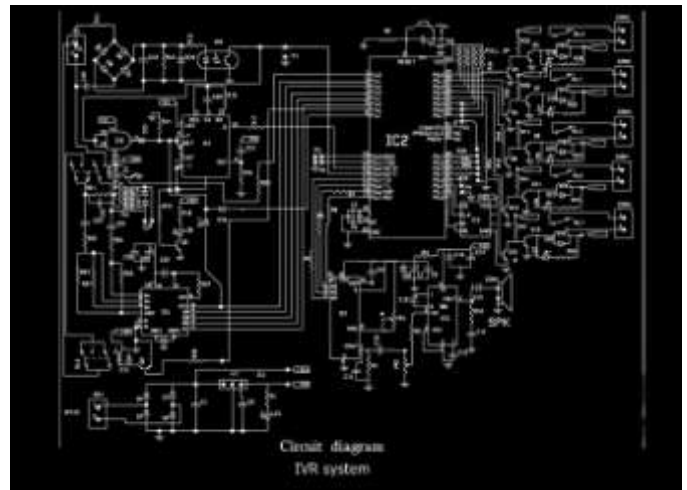
### Auto-mode System Process

In auto mode following operation take place in the system as below mention :

All the sensors should be logic low active whenever any sensor is activated it's output will become low and PORT PINS P2.4,TO P2.6 will detect the pin low. Following action will take place

1. All the loads connected on port 0 will be switched off.
2. Emergency message will start.
3. Off hook relay will be activated
4. Stored telephone number will be dialed out.
5. Emergency message will be delivered.
6. Telephone number will be dialed out five times at the interval of one minute
7. After five dialout is over sensors will be rechecked if condition still exists again 5 redial will take place.
8. This process will continue till the condition becomes normal or a person comes and switch off the device.

The IVR system circuit representation



### III. PROCESS

Now we will use this theory in Keil software. Embedded C is a set of language & extension for the C Programming language by the C Standards committee to commonality issues that exist between C extensions for different embedded system. Historically, embedded C programming requires nonstandard extensions to the C language in order to support exotic features such as fixed-point arithmetic, multiple distinct memory banks, and basic I/O operations.



Fig.3 Flow Chart of IVRS System for Industrial Control

In future, the concept of Interactive Voice Response System can be used in various transport department like bus transport, metro rail, railways and airport. Transport companies not only need be fast and responsive,, but also need to provide customers with easily accessible information system.

#### IV. FURTHER ISSUES & CONCLUSION

We are currently extending the system to add some parameters like temperature, fluctuation. And password security is basic, we control the devices but not full control on it. Because of the slowness and multiple menus of system we can make it better the system at present system. It will be digitally accessed also gives strong data base and can be operate easily at low cost. And future will show every organization will be used an IVR system

Thus we have studied The Kiel software along with that we have learned how work IVR & used in day today life. Which can be used for High Security purpose. We have designed our system such a way that if any unknown person will not enter in system or not handle it without password. Where our system is installed at industrial machineries or devices

IVRS can be used in organization to know about various department, mode of working and levels of control. Hardware circuitry of IVRS is very compact and it can be used as card in computer. By the wide spread of internet it is possible to know information from anywhere in the world with advanced features of interactive Voice Response System.

The program is developed by using keil software. It acts as a compiler, in which the program is written in Keil development tools for the 8051 Microcontroller Architecture support every level of software developed for the useful applications

The industry-standard Keil C Compilers, Debugger, Kernel, Single-board Computer, and Emulators support all 8051 derivatives.

#### APPLICATION

1. It can be used in protection of High costly Industrial Production machines
2. To easy access or Banking & Finance
3. To reduce the Human effort & save important time
4. Automatic control on devices from anywhere
5. To proper maintenance of Education system
6. In Government system
7. Telecommunication
8. System control & Security of the system on small mobile phone
9. Automatic machine or device safety to secure the university sites.

#### V. REFERENCES

- [1] Thiagarajan & Vishwanathan "Telecommunication Switching System & Networks" Second Edition. India PRI Pvt.ltd.
- [2] Kenneth J Avala "The 8051 Microcontroller Architecture programming and Application" second edition.
- [3] Douglas V Hall "Microcontroller and Interfacing" second edition TMH publishing.

