GSM Signal Detector With Audio Visual Alert Indication Using Psoc Mixed Signal Array

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Abstract: *in this paper describes the path follower robot series which helps in detecting the signals from far distance, any land mine, and any gas leakage in surroundings.The design is to provide a detector to sense the signal transmission from any far distance, any leakage of gas, any presence of any land mine etc. The GSM transmission detector can sense the presence of an activated mobile phone from a distance. So it can be used to prevent use of mobile phones in examination halls, confidential rooms, etc. In this design the sensors to detect the signals are attached to the Psoc. The path follower which is connected to the Psoc when it detects the signals from any far distance ,if any leakage of gas takes place near to it ,if any land mines are present near to the path which is following by the path follower it gives the indication by indicators like alarm,led,buzzer etc.*
Keywords: *PSoC (Programmable System on Chip), GSM signal detector, landmine detector, gas leakage detector, signal indicators and display devices.*

I.   Introduction

In the recent trends the GSM transmission detector can sense the presence of an activated mobile phone from a distance. So it can be used to prevent use of mobile phones in examination halls, confidential rooms, etc. It is also useful for detecting the use of mobile phone for spying and unauthorized video[1,2] transmission. In this design we are using the path follower robot series which helps in detecting the signals from far distance, any land mine, and any gas leakage in surroundings. This is a path follower robot series which is connected to the Psoc which follows the line which is drawn on the surface that may be black line on white surface or vice versa [3,4]. It is used to detect the transmission of signal from any far distance, if any presence of land mine buried under the ground, if any leakage of gas takes place in the surroundings etc., .The sensors which are used to detect the signals are connected to the Psoc which is the main part in the design.

This unit can be easily incorporated into an alarm unit, to sound an alarm or give a visual indication of the LPG concentration. The sensor has excellent sensitivity combined with a quick response time. When GAS leakage is detected then the signal indicator will indicate by the help of lcd display [5, 6]. Similarly if any signal is transmitted or if any detection of land mine is found the signal indicators gives us the information by the lcd display. The signals which are present near to it like unauthorized signals or any land mine or any leakage of gas can be detected with this successfully [7].

II.   System Design Model

2.1   Software design module

The development process for the PSoC device differs from that of a traditional fixed function microprocessor. The configurable analog and digital hardware blocks give the PSoC architecture a unique flexibility that pays dividends in managing specification change during development and by lowering inventory costs. These configurable resources, called PSoC Blocks, have the ability to implement a wide variety of user-selectable functions.

Each block has several registers that determine its function and connectivity to other blocks, multiplexers, buses, and to the IO pins. Iterative development cycles permit you to adapt the hardware as well as the software. This substantially lowers the risk of having to select a different part to meet the final design requirements. To speed the development process, the PSoC Designer Integrated Development Environment (IDE) provides a library of pre-built, pre-tested hardware peripheral functions, called "User Modules." User modules make selecting and implementing peripheral devices simple, and come in analog, digital, and mixed signal varieties. The standard User Module library contains over 50 common peripherals such as ADCs, DACs Timers, Counters, UARTs, and other not-so common peripherals Such as DTMF Generators and Bi-Quad analog filter sections. Each user module establishes the basic register settings that implement the selected function. It also provides parameters that allow you to tailor its precise configuration to your particular application.

For example, a Pulse Width Modulator User Module configures one or more digital PSoC blocks, one for each 8 bits of resolution. The user module parameters permit you to establish the pulse width and duty cycle. User modules also provide tested software to cut your development time. The user module application programming interface (API) provides high-level functions to control and respond to hardware events at run-time.

The development process starts when you open a new design and bring up the Device Editor, a graphical user interface (GUI) for configuring the hardware. You pick the user modules you need for your design and map them onto the PSoC blocks with point-and-click simplicity. Next, you build signal chains by interconnecting user modules to each other and the IO pins. At this stage, you also configure the clock source connections and enter parameter values directly or by selecting values from drop-down menus.

User Module and Source Code Development Flows
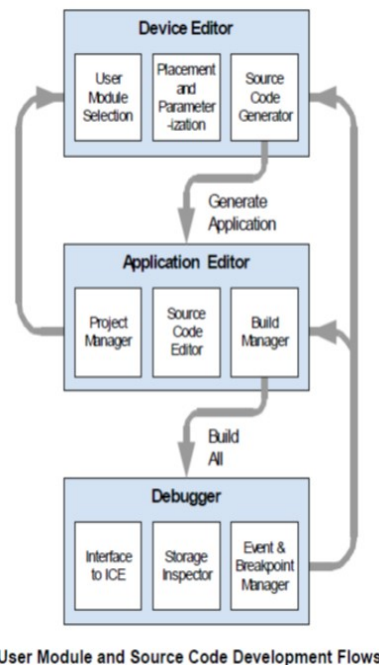
The last step in the development process takes place inside the PSoC Designer's Debugger subsystem. The Debugger downloads the HEX image to the In-Circuit Emulator (ICE) where it runs at full speed. Debugger capabilities rival those of systems costing many times more. In addition to traditional single-step, run-to-breakpoint and watch-variable features, the Debugger provides a large trace buffer and allows you define complex breakpoint events that include monitoring address and data bus values, memory locations and external signals.

2.2 Hardware design module
BLOCK DIGRAM
The block diagram consists of Psoc, motor driver, Gsm detector, Land mine detector, Gas detector, Signal indicators.
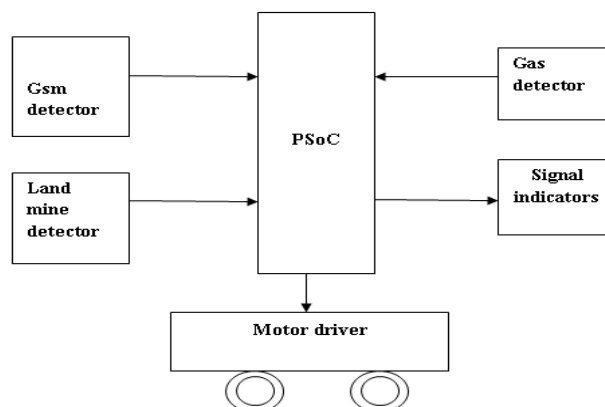

Figure: experimental set-up block diagram

The above block diagram gives an overview of the design in the pictorial form. With the help of the block diagram we will create pre-model of the design and analyze the function of the design. This is a path follower robot series which is connected to the Psoc which follows the line which is drawn on the surface that may be black line on white surface or vice versa. The motor driver i.e. L293D motor which is used to drive the path follower to move along the path. It is used to detect the transmission of signal from any far distance, if any presence of land mine buried under the ground,if any leakage of gas takes place in the surroundings etc. The sensors which are used to detect the signals are connected to the Psoc which is the main part in the design. The detected signal will be given to the signal indicators which are attached to the PSoC and by this we get information regarding the detected signals or if any landmine is present in the ground and if any gas leakage occurs.

III. Experimental Results

In the results the sensors to detect the signals are attached to the Psoc. The experimental set-up shown in the figures below.The path follower which is connected to the Psoc when it detects the signals from any far distance, if any leakage of gas takes place near to it, if any land mines are present near to the path which is following by the path follower it gives the indication by indicators like alarm, led, buzzer etc.

The design kit is shown in the figure below. When the signals are detected the path follower which is moving gets stopped and the indication is given on the LCD Display. The results are also shown in the figure below.

Figure: experimental setup.

Figure: display system of experiment.

IV.   Conclusion

      A Gas sensor is used to Detect dangerous gas leaks in the kitchen. Ideal to detect dangerous gas leaks in the kitchen. Sensor can be easily configured as an alarm unit. The sensor can also sense LPG and Coal Gas as well as Ideal sensor for use to detect the presence of a dangerous LPG leak in your car or in a service station, storage tank environment. This unit can be easily incorporated into an alarm unit, to sound an alarm or give a visual indication of the transmission of any signal from far distance and also the presence of any LANDMINE in the ground. The sensor has excellent sensitivity combined with a quick response time. When GAS leakage is detected the indication of gas leakage will be given by the signal indicators like lcd .Similarly if any signal is transmitted or if any detection of land mine is found the signal indicators gives us the information by glowing the led's and by displaying the message on the LCD Display so that we can understand that the presence of landmine in the ground. Similarly when there is a transmission of the signal from any far distance we can get the information by the message which will be displayed on the LCD Display. The signals which are present near to it like unauthorized signals or any land mine or any leakage of gas can be detected with this successfully.

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