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Infrared Sensor and FBUS Technology for House Security System Based on Mobile Phone

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ABSTRACT

The growing of technology in this information age is very fast and force us to compete to get more information, that information is power. Computer system and hand phone technology that has grow so fast can be used to get information about anything at any place, include if we aplicate it to house security system.According to the situation that not getting better, but getting worse, people need some protection system that can protect their properties better. This security system exist to answer the need. This security system work based on the ability to receive signal from port LPT1 of printer and the ability to use modem as comunication device. Port LPT1 will detect the signal that sent from infrared receptor through status register. If computer detect any signal then computer will send short messages to the recipient, police or user by phone number that the data taken from data base, so police can immediately come and secure the place.

Keywords: *Infrared, Modem, Security System, Short Messages.*

1 INTRODUCTION

Advances in technology in this information era very rapidly. This makes the human must be fast in getting the information, because information is power forward. Computer technology and mobile phones are already highly developed can be used to obtain information about any and everywhere, including when applied to house and shop security systems.

This topic adopted lately considering the crime rate is very high, and disturbing the owners of abandoned house or shop at night or for going home. Many people are willing to pay a premium for the service provider to maintain security through security like security forces. We were not only cost very much, but its security system was less than the optimal. If a robber or thief came in large numbers or with a deadly weapon, then the security unit can be easily overpowered. In addition, human labor is also limited and sometimes also experience fatigue that can occur is called negligence or human error.

Through this research, the authors tried to take advantage of SMS technology through communication between cell phones and computers, with the support of the use of infrared sensors attached to the printer port or LPT1. Through this security system, besides the cost is relatively cheaper, is also a higher level of security because the system is able to tell apart from the owner of the house, also the police and citizens in a relatively quick time.

2 METHODOLOGY

To obtain maximum results, particularly in research on home security systems using infrared sensors and SMS gateway, then do the research methodology as follows:

1. The study of literature

The study of literature in the form of literature and search theoretical foundations that will be used to preparation of security systems through

magazines, books on computer interfaces and journals on the internet.

2. Work on the prototype

3. The stages to be performed :

   - Finding aids, tools that are used to access ports LPT1 and CDMA modems, and preparation of infrared transmitters and sensors.
   - Preparation of design software that will be used to control the infrared sensor and the modem will send and receive SMS.

4. Implementation and testing.

Implementation and testing of the strengths and weaknesses of the system that has been created.

2.1 Parallel Terminal

At first the parallel terminals introduced by IBM as an alternative to the slower serial terminal. The function of parallel terminals initially was just the computer communicate with the printer. Because of the growth will be increasing external devices, communication between computers and equipment increased another party. But the development of the faster processor, the ability of parallel terminals initially deemed inadequate, it gives birth to a new standard in parallel terminal capable of handling up to 1 Mbps data transfer, cable length can reach 10 meters, and can be two-way communication (bi-directional) [2].

Standard pin diagram of parallel terminals:

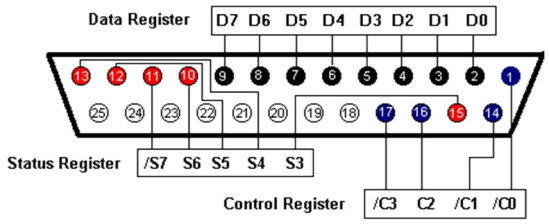

Fig. 1. Pins of parallel terminal

2.1.1 Function of standard pins of parallel terminal connector:

Table 1: Function of standard pins of parallel terminal [2]

Pin No (D-Type 25)	**Pin No (Centronics)**	**SPP Signal**	**Direction In/out**	**Register**	***Hardware inverted***
1	1	nStrobe	In/Out	Kontrol	Yes
2	2	Data 0	Out	Data	
3	3	Data 1	Out	Data	
4	4	Data 2	Out	Data	
5	5	Data 3	Out	Data	
6	6	Data 4	Out	Data	
7	7	Data 5	Out	Data	
8	8	Data 6	Out	Data	
9	9	Data 7	Out	Data	
10	10	nAck	In	Status	
11	11	Busy	In	Status	Yes
12	12	Paper-Out / Paper-End	In	Status	
13	13	Select	In	Status	
14	14	nAuto-Linefeed	In/Out	Control	Yes
15	32	n*Error* / nFault	In	Status	
16	31	nInitialize	In/Out	Control	
17	36	nSelect-Printer / nSelect-In	In/Out	Control	Yes
18 - 25	19-30	Ground	Gnd		

Notes:

- Ground pin is connected with all above ground.
- Sign "n" in front of the pin name indicates the signal is active low (logic 0)

The sign "/" on the status and control bits indicate that the hardware is inverted, namely that the signal "reversed" by a parallel terminal interface. For example BUSY lines, if the +5 V (logic 1) is inserted into the pin and then reads the status registers, then it will generate 0 volts (logic 0) in bit 7 in the status register. In addition to the hardware

pin inverted above, the output parallel terminals of logic TTL (Transistor- Transistor Logic), a logic 0 means 0 volts, and a logic 1 is 5 volts. Current that can be drawn or inserted through the terminal parallel ranges + 12 mA, exceeding it can permanently damage the device.

2.1.2 Signal of Parallel Terminal

A brief description of the parallel terminal signals (standard) is as follows [2]:

Signal Names Signal Description SPP
nSTROBE : Set the low pulse of 0.5 μ seconds for the data stated in
D7 : D0 is valid
Data 0 : Least Significant Data (LSB)
Data 1 : Data bit 1
Data 2 : Data bit 2
Data 3 : Data bit 3
Data 4 : Data bit 4
Data 5 : Data bit 5
Data 6 : Data bit 6
Data 7 : Data bit 7

nACK : Low Pulse +5 μ second indicates the data has been received;

BUSY : High value if the printer is busy / offline.

PaperEnd : High value if the printer is out of paper.

Select : High value if the printer is on-line.

nAUTOFEED : If set low, the printer will move the line every encounter a carriage return.

nError : Low value if the printer error.
nInit : Low Pulse + 50 μ second to initialize or reset the printer.

nSelect-In : High value if your printer is selected.
Ground : Ground.

3.2 Infrared

Passive Infrared (PIR) detectors are used to sense thermal energy emitted by the human body. By detecting emitted rather than reflected energy, the device performance is less affected by the ambient lighting condition. Additionally, due to the generally lower temperature and emissivity of the surroundings, the target-to-background contrast is much better than with visible light cameras.
The signal is analysed and a decision about the motion direction is made. The direction discrimination currently is limited to movements that are close to parallel to either axis, therefore producing four possible direction outputs. The captured sample data shows that there is sufficient information in the signal that can lead to a much better direction resolution [1].

3 RESULTS AND DISCUSSION

3.1 The system developed

Security system to be developed here is a pilot (prototype) security systems based FBUS technology, especially the SMS gateway and parallel terminal programming. The program will display information to the user via SMS gateway if infrared sensors detect active there are interruptions. This system aims to activate the alarm (warning) and inform the user if the infrared sensor disconnected receives infrared signal.

3.2 Limitation System

Limitations in the security system is:

1. This system provides information to users using SMS via mobile phone carried by the user wherever the user is located while in the coverage area, enable and disable some or all of the infrared sensor using either SMS or using a computer, or any sensor information current through SMS.
2. Since this system was developed and is still a small-scale pilot, then place could be implemented within the system is still home, where sensors are still limited to 5 sensors used.
3. Since the the system is still in prototype form (pilot), then infrared sensor used is an infrared sensor at close range (2-3 m). In a real situation that is used is the infrared sensor which is amplified and can receive signals from a distance of up to 20 meters.

3.3 Hardware

The hardware used here is divided into 3 modules (part), ie

1. One unit of PC (Personal Computer) that manages all the security systems work.
2. Infrared transmitter that continuously emits infrared light and receiver (sensor)

infrared receiving infrared rays are connected to the computer using a line of parallel terminals communication.

3. One unit of the CDMA modem with chip card of Telkom Fleksi active and has a pulse, is connected to the computer using the USB terminal

3.4 Software

The software was developed using Visual Basic version 6.0. The author chose to use this programming language because a programming language in addition to the already common and more used, also systematic use is more easily [3].
Library used herein are MFBUS15.OCX, This ActiveX provides facilities that are very useful in developing the security system, and is also a freeware so there is no cost to get it. ActiveX capabilities are [5]:

1. Send and receive SMS.
2. Manage logo operator.
4. Manage date and time.
5. Manage StartUp text.
6. Manage Phonebook.
7. Status ponsel.
8. Dial / DTMF
9. Monitoring features.

Of the 8 functions that can be used, the author uses only the first function, which sends and receives SMS.
In outline the workings of the security system described:

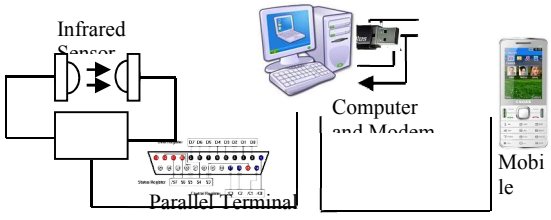

Fig. 2. Schematic outline of the hardware

Essentially all of the pins on the parallel terminals will provide value "1" (high) as the default. The author took the insert to create a series that will provide value to "0" on the status of the terminal which is located on the 379H [2].
Data on the status of the terminal read 8 bits, so that the reading becomes:

Table 2: Table status bit parallel terminals

Pin 7	Pin 6	Pin5	Pin4	Pin3			
0	1	1	1	1	1	1	1

Reading of data by default is "01111111" or decimal value is equal to 127. If the received signal pin 6 low, meaning the value to "00111111" in binary or decimal is equal to 63, and so on [2].

3.5 System Design

This system is used by various users from various backgrounds, therefore the design of the interface is made as easy as possible, as shown below.

1. Beginning Interface (Login)

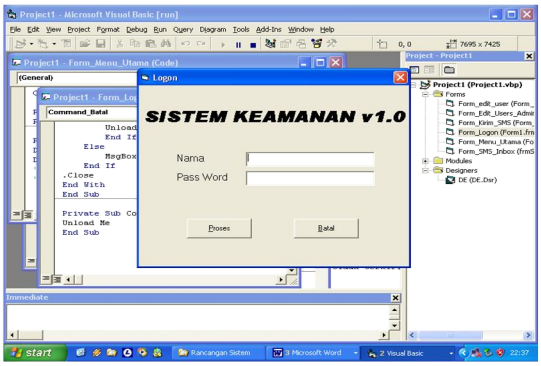

Fig. 3. Design of Beginning Interface (login)

2. Interface of Main Menu

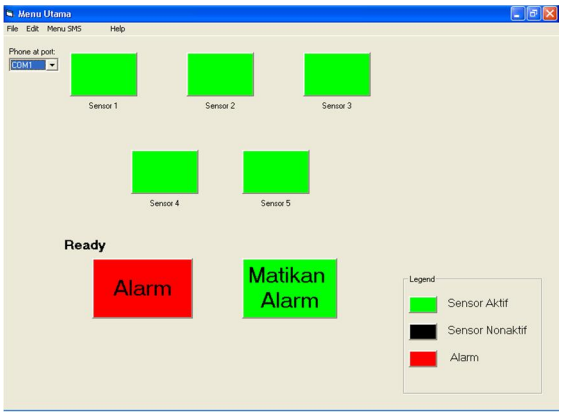

Fig. 4. Design of Interface Main Menu

3. Interface Menu Edit User

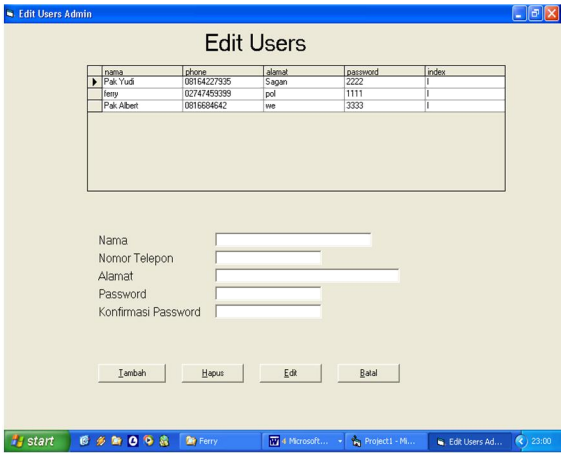

Fig. 5. Design of Interface Menu Edit User

Field name is used as an index and is unique, given the scale used is still small scale so that duplicate names could be said not happen. The program will search for first names corresponding to the names of the txtnama, then after the meet then the record is deleted.

4 CONCLUSION

Based on system implementation and analysis of security system that has the author made, then conclusion is:

1. This security system has been able to meet the needs of consumers in the home security quickly.
2. This security system also can minimize the mistakes that often occur when using human power.
3. This security system also had to answer the needs of users in terms of user friendliness. This system was designed as simple as possible so that users are not confused to operate.

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