

INVENTORS

MOHD KHAIRUL FADZLY BIN ABU BAKAR
AMARUL BIN TALIP
SHAYFULL ZAMREE BIN ADD RAHIM
MOHD NASR BIN MAT SAAD
MOHD FIDZWAN BIN MD AMAN HANZAS
BADRIUL AZMI ABDUL ROLED

CONTACT DETAILS

Green Design and Manufacture Research Group,
Center of Excellence Geopolymer and Green
Technology (CEGeoGTEch),
School of Materials Engineering,
Universiti Malaysia Perlis (UniMAP),
01000 Kangar, Perlis.

School Of Manufacturing Engineering
Pauh Putra Campus, UniMAP, 02000 Arau, Perlis.
e-mail: fadzy@unimap.edu.my
HP: 017-6963886

GSM X1 SMART HOME AUTOMATION SYSTEM



SUMMARY OF INVENTION

This invention is the result of extensive research to develop affordable home automation system for security and safety purposes. GSM X1 SMART HOME AUTOMATION SYSTEM is a product which integrate science and technology to enhance safety and quality of living in residences. The home automation system is designed for convenience and comfort, improve security and energy efficiency. In recent years the popularity of home automation systems has increased dramatically, while the ownership of mobile phones and tablets also increased significantly. This factor gives an indication there is a high commercial opportunities GSM X1 SMART HOME AUTOMATION SYSTEM. Furthermore, the home automation system can save our time and be able to reduce electricity bills as well as to enhance the security of the residence. The system is designed to use the Global System for Mobile Communications (GSM) signal because it is quite simple and flexible and have the ability to use Short Message Service (SMS) or telephone service. GSM was selected and used because of signal reception capability and coverage area of GSM is extensive covers both urban and inland areas, as compared to the General Packet Radio Service (GPRS), 2nd Generation Network (2G), 3rd Generation Network (3G) and 4th Generation (4G) signal. GSM-RELAY is an electronic board with an on-board GSM modem. The system is designed to perform real-time and interactive activities using GSM signal or in other words, using GSM-based mobile phone as the remote control. The system is also capable of receiving commands via SMS by phone. This system can also be programmed via SMS command and it is safe to do so, because of no one even knows the number of the line being used. The system also has a password and is quite impossible for anyone to access the system or by chance.

PROBLEM STATEMENT

1. Inadequate Security. Home automation can enhance the security of the residents and their property as well as reduce the risk of criminal cases.
2. Waste of time to open and close the door using the keys. This system allows for the opening and closing of the door by using a mobile phone either by SMS or a phone call (Keyless).
3. High expenses to pay utility bills and travel costs. The system reduces the costs associated with the utility because the user can turn off and turn on the electricity from the user's location without having to go back to their homes.

ADVANTAGES

1. Improve the safety and quality on residential monitoring system.
2. Facilitate residents to monitor and ensure their homes are always in safe conditions.
3. Save time and energy in order to increase residential security.
4. There are no call charges for each of the operating instructions over the phone.
5. Works with GSM phones either by call or SMS.
6. The system can operate and work with all electrical appliances.
7. Operations and changes to passwords can be made via mobile phone (remotely control) for security purposes.
8. Caller ID verification is required for security purposes.

NOVELTY OF INVENTION

This system is designed and invented so that it is safe, affordable, economical and can be installed and compatible with residential wiring system in Malaysia.

RELATED CASES IN MALAYSIA

1. Home automation is able to improve the safety of people and their property. Statistics show thefts (15.1%) and burglary during the day (21.8%) experienced a significant increase. This indicates that the home automation system is needed to reduce the crime rate.
2. This system can reduce electricity consumption thereby lowering the electricity bill.
3. This intelligent system can reduce the burden of human resources in order to increase home security.
4. The ability of a system to automate home appliances, such as to turn on and control the appropriate temperature before residents arrived and entered the house.

Table 1: Property crimes by category, Malaysia, 2008-2009

Crime category	2008 Crime Index	2009 Crime Index	2008 Population	2009 Population	Change (%)	Change (%)
Stealing	41,215	39,874	149.4	148.0	-3.5	-3.7
Stealing of truck/ van	6,263	5,720	22.7	20.2	-2.5	11
Stealing of car	15,198	13,868	55.1	49.1	-6	-10.9
Stealing of bikes	67,359	61,054	244.1	215.7	-28.5	-11.7
Snatch thefts	8,206	9,687	29.7	34.2	4.5	15.1
Daytime burglary	9,118	11,306	33.1	40.3	7.2	21.8
Night time burglary	26,470	27,060	95.9	95.6	-0.3	-0.4
Total	173,828	168,679	630.0	596.9	-34.1	-5.4

Table 2: Technologies available for home automation system

Technology	Method	Typical of these	Advantages	Disadvantages
Microcontroller Relay (UART)	Using SMS coding system	Condominiums and Semi-detached house (semi-D)	-Cheaper than other method. -Simple -Only use SMS command	-Need much time to type the SMS command. -Complex use messaging.
Remotely GSM Relay (CALL)	Using phone call only	Semi-detached house (semi-D) and Condominium	-Quick and efficient. -Faster respond via phone call.	-One channel can only use for one input or output. -Cannot control multiple devices.
Remotely GSM Relay (CALL and SMS)	Phone call and SMS	Semi-detached house (semi-D) and Condominium	-Reduce the use of time and have two choices. -Can control multiple devices.	-Need server of SMS command
3G/4G Data mobile network (Internet)	Using internet mobile network such as 2G, 3G	Semi-detached house (semi-D) and Condominium	-Has the application and easy to use. -More data can be transmitted.	-Limited network coverage 2G, 3G. -Mobile network cost. -Response depends on network data.
Wired network	Using internet, LAN, Ethernet, etc.	Semi-detached house (semi-D) and Condominium	-Fast and easy to use. -Has application (software support) -More data can be transmitted.	-Limited network coverage depends on the wires. -Easy to breakdown if wire is broken.



Figure 1: GSM X1 Smart Home Automation System



Figure 2: Home model scale

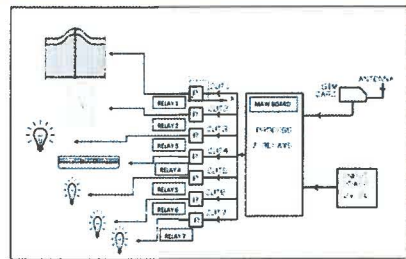


FIGURE 3: Wiring System for GSM X1 Smart Home Automation

Table 3: Call and sms command for GSM X1 Smart Home Automation System

No.	Relay No.	Model Indicator	Home appliances	SMS Command
1	CH1	240 Volt AC Bulb	House Gate	CALL FUNCTION (ON/OFF) #PWD123456OUT1+ON #PWD123456OUT1-OFF
2	CH2	240 Volt AC Bulb	Porch Lamp	#PWD123456OUT2+ON #PWD123456OUT2-OFF
3	CH3	240 Volt AC Bulb	Air conditioner 1	#PWD123456OUT3+ON #PWD123456OUT3-OFF
4	CH4	240 Volt AC Bulb	Living Room Lamp	#PWD123456OUT4+ON #PWD123456OUT4-OFF
5	CH5	240 Volt AC Bulb	House Alarm	#PWD123456OUT5+ON #PWD123456OUT5-OFF
6	CH6	240 Volt AC Bulb	Door Lock System	#PWD123456OUT6+ON #PWD123456OUT6-OFF
7	CH7	240 Volt AC Bulb	Air conditioner 2	#PWD123456OUT7+ON #PWD123456OUT7-OFF

***Note: CH1 = Relay Channel Number 1, PWD123456 = Password System is 123456, OUT1=Output at Relay Number 1 and ON/OFF is output is ON or OFF