POTABLE WATER THEFT INDICATION AND AUTOMATIC BILLING SYSTEM

GOWTHAMI.R [#1],HARITHA.M [#2]
ME-First year , Department of VLSI Design,
Tagore Institue Of Engineering And Technology,
Deviyakurichi(po),Attur(tk),Salem(dt),Tamilnadu, India.
gowthamiece95@gmail.com, rrrajapriya@gmail.com.

ABSTRACT

The rapid apposition of the wide urban residential areas imposes the expansion as well as the modernization of the existence water feed facilities. Along with this one more problem is identified in the water feed channels, few people use ½ HP to 1 HP pump to drink the water directly from the channel of their home street. Process automation system based upon capitalization of an industrial microcontroller and PC systems including all the net procedure components corresponds the best way to improve the water organization technological process. The water theft can be best monitored by the emission variations given by the emission sensors affixed on the channels. The system includes Remote Terminal Units - RTU, specific transducers and actuators spread on a wide geographical area and control and power panels for the pump stations. The dependable instrumentation attached to microcontroller ascertain real time observation of the main technological parameters large water organization procedures.

The data acquired of microcontroller system (Supervisory Control and Data Acquisition) correspond the encourage for improvement of the process and data- driven Decision Encourage System. Then monthly water capitalization can be sent to municipal Freddie Mac office within fraction of seconds in the form of text mail using GSM Modem. The intended bill is based on the sum of water consumed by the consumer and then the billing sum will be sent to the consumer site through SMS. This text mail consists of bill sum with due date. If the consumer payment process is accomplished on or before the due date, then water feed will be attached otherwise water feed connection will be disattached.

INTRODUCTION

Out of the earth surface almost 71% surface is encrusted with water. Only 3% of water can be used as swilling water or new water and 97% water is sea water which cannot be used by human out of 71% accessible water on earth. With the perpetual

1169

economic growth, the water want of attempt is also increasing. Tremendous population of growth causes inadequate and uneven organization of swilling water. So measuring the water capitalization and providing it with proper sum will limit the wastage of water in society. Antecedently few traditional methods were used such as mechanical meters in which water emission drives mechanical adapt which drives oncoming arrow pointer on the water meter scale, such meter need to be read in consumer premises which is time consuming process. The observation of water resource for these attempt can queer the occurrence of rustling water and leaking water effectively. Therefore, the observation system of urban water feed has aroused extensive attention in recent years. Urban water feed net procedure s form the link between swilling water feed and swilling water consumers. These large-scale net procedure s are vital for the endurance of urban life, for maintaining a healthy level of economic advancement, and for the perpetual operation of factories and hospitals. In world, urban water feed systems are public attempt, usually part of a local government, and the recent increased involvement in privatizing public attempt has not led to reforms of water systems. Nonetheless, in about 50 cities in the developing world, the water system either has been grant to a non-governmental entity for its operation and maintenance. Then by using computer intrusive billing can be done. Such system inevitably manpower and it takes few time in collecting and distributing bills.

EXISTENCE SYSTEM

The water feed systems are part of the urban infrastructure which must ensure the continuity of the water organization, the water quality control and the observation and control of the technological process parameters, and deal with the quantification imposed by the water convenience, hydrological modes, the storage capacity of the tanks and water towers and the increasing unvaried of water use. In existence system, urban water is supplied to the home with the help of few man power. The person in rush will go to the place and then open the valve to that particular area. Christo Ananth et al. [8] discussed about Intelligent Sensor Network for Vehicle Maintenance System. Modern automobiles are no longer mere mechanical devices; they are pervasively monitored through various sensor networks & using integrated circuits and microprocessor based design and control techniques while this transformation has driven major advancements in efficiency and

1170

safety. In the existing system the stress was given on the safety of the vehicle, modification in the physical structure of the vehicle but the proposed system introduces essential concept in the field of automobile industry. It is an interfacing of the advanced technologies like Embedded Systems and the Automobile world. This "Intelligent Sensor Network for Vehicle Maintenance System" is best suitable for vehicle security as well as for vehicle's maintenance. Further it also supports advanced feature of GSM module interfacing. Through this concept in case of any emergency or accident the system will automatically sense and records the different parameters like LPG gas level, Engine Temperature, present speed and etc. so that at the time of investigation this parameters may play important role to find out the possible reasons of the accident. Further, in case of accident & in case of stealing of vehicle GSM module will send SMS to the Police, insurance company as well as to the family members.

So the theft interrogation or one who does the theft is difficult to identify in the early methods.

DRAWBACKS

No automatic billing system This type of operation inevitably man

power. This is squander of time to go to that place and emanate back often.

SUGGESTED SYSTEM

In this project procedure , it is suggest that the capitalization of anti-theft control system for swilling water feed. By implementing this suggest system in a real time; certainly it will be able to control the swilling water theft in the domestic areas. In urban areas the water feed to residence and mercenary establishments are crenelated at a fixed emission rate. There are happening of unneeded water drawing by certain consumer s/users by connecting motor-pump sets to the water lines which is advised as water theft. In this project procedure , it is suggest to develop an embedded based remote water observation and theft interrogation system by recording the emission rates at the consumer/user end. In order to implement the suggest water feed system, each consumer end should be crenelated with an embedded based water emission observation system consisting of a microcontroller to record the emission rate using a emission sensor and to transmit the same to a remote observation station using wireless transmitter. Billing software calculates bill based on sum of water used. Intended bill can be sent through SMS in terms of print out to

1171

the consumer . Whole mechanism of collection of water capitalization and providing bill take few minutes, which will be quickest and low cost process over the existence water organization and billing system.

SYSTEM ANALYSIS

The full serviceable block diagram of a device is shown in fig 2.1. The device consist of power feed, water emission sensor, PIC 16F877A, Relay / driver, water emission cut, LCD, Buzzer, GSM modem transmitter, Mobile receiver. Digital output from the PIC microcontroller is given to the LCD,

Regulator IC (ULN2003A) Regulator IC is used to amplify the voltage from PIC microcontroller. Output from PIC microcontroller will be 0 or 1, if output is 0 relay is OFF mode. If output is 1 relay goes to ON mode. So instantly water emission through the pipe will be disattached. And also if the consumer does not pay

the bill the relay will go to ON mode, water connection will be disattached signal when theft occurred And buzzer is used to make audio based water emission observation system consisting of a microcontroller to record the emission rate using a emission sensor and to transmit the same to a remote observation station using wireless transmitter.
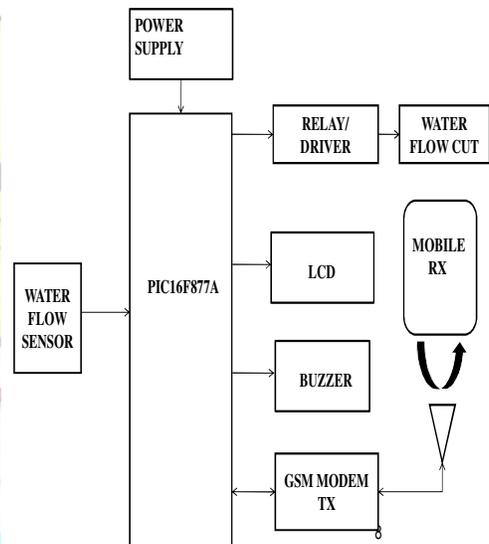

Fig 2.1.1: Basic block diagram of system
Figure 2.1.2: Architecture of PIC Microcontroller

Device	Program Flash	Data Memory	Data EEPROM
PIC16F874A	4K words	192 Bytes	128 Bytes
PIC16F877A	8K words	368 Bytes	256 Bytes
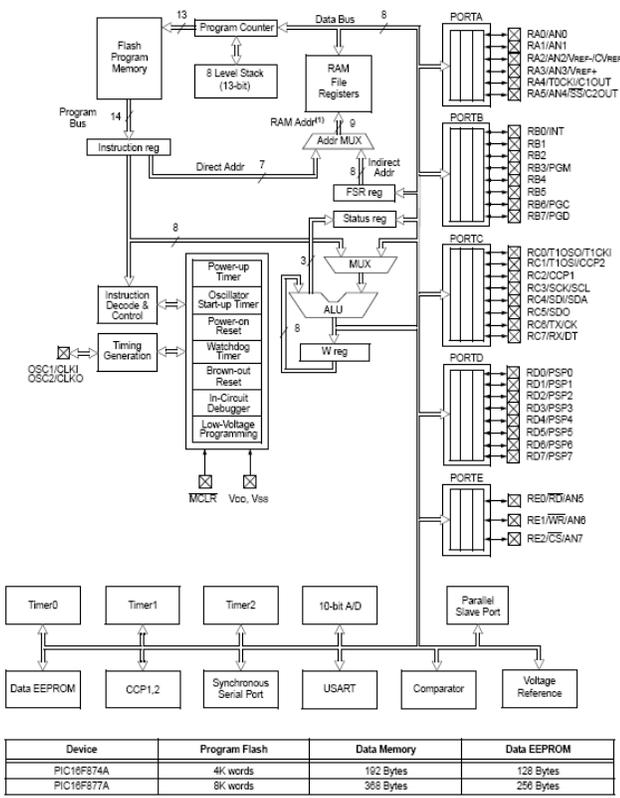
to display the theft occurrence GSM is a important component for automatic billing system GSM modem is used to transmit the billing details to the consumer .

PIN DESCRIPTION

Few pins for these I/O ports are multiplexed with an alternate function for the peripheral property on the device. In general, when a peripheral is indue, that pin may not be used as a general purpose I/O pin. Additional information on I/O ports may be establish in the Mid-Range.

CIRCUIT DIAGRAM

Water emission sense the emission variation in pipes using ball sensor. Analog values are given to the PIC microcontroller, which converts the analog value in to digital using ADC.PIC microcontroller have in build ADC. Digital output from the PIC microcontroller is given to the LCD, Regulator IC (ULN2003A) Regulator IC is used to amplify the voltage from PIC microcontroller. Output from PIC microcontroller will be 0 or 1, if output is 0 relay is OFF mode. If output is 1 relay goes to ON mode. So instantly water emission through the pipe will be disattached. And also if the consumer does not pay the bill the relay will go to ON mode, water connection will be disattached And buzzer is used to make audio signal when theft occurred.LCD is used
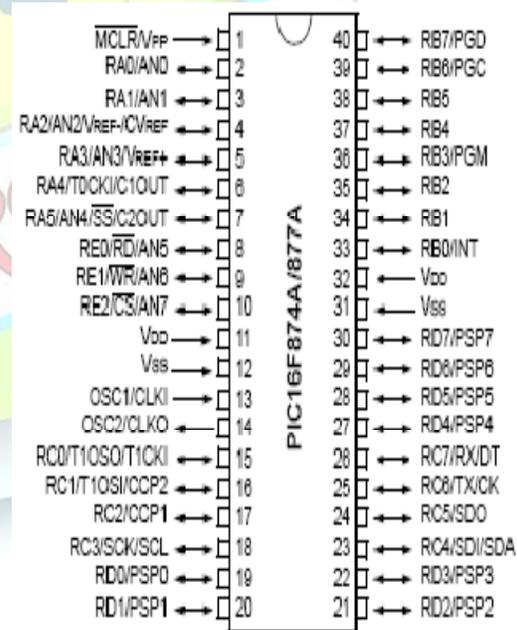

Figure: 2.1.3 Pin diagram of PIC Microcontroller

WATER EMISSION SENSOR (YFS-201)

1173

This sensor sprawl in line with your water line and contains a pinwheel sensor to determine how much liquid has stirred through it. There's an integrated magnetic hall effect sensor the outputs an electrical beat with every revolution. The hall effect sensor is irrevocable from the water pipe and allows the sensor to keep safe and dry. The sensor emanates with three wire: Red(5-24VDC power), black(ground) and yellow(hall effect beat output).By counting the beats from the output of the sensor calculation of water emission made easily. Each beat is approximately2.25 milliliters. Note this is not a exactitude sensor and the beat rate does vary a bit depending on the emission rate, fluid pressure and sensor position. It will need careful calibration if better than 10% exactitude required. However its great for basic determine ment tasks Determine liquid/water emission for your solar, water preservation systems, storage tanks, water recycling home applications, provision systems and much more. The sensors are solidly constructed and crenelate a digital beat each time an sum of water passes through the pipe. The output can easily be attached to a microcontroller for observation water capitalization and calculating the sum of water remaining in a tank etc.

Property:
Model: YF-S201
Procedure ing Voltage: 5 to 18V DC (min tested procedure ing voltage 4.5V)
Max current draw: 15mA @ 5V
Output Type: 5V TTL
Emission sensor based water meter presents very low cost, dependable, quick water meter system accompanying with existence GSM netprocedure s. Paddle wheel emission sensor JT121 determine s the water emission precisely with the help of rotating paddles.

DISCUSSION

The system crenelates precise and real time water billing system. This overemanates existence system in terms of cost and manpower required. Decreased cost of the whole system will encourage to use as efficient and logical metering system. Monthly billing cycle can be preserved to limit the use of precious natural resource water. The automation implemented in water organization system ascertain to avoid wastage of water and reduces time. Due to PIC Microcontroller it is possible to monitor and control whole system from head forecastle. This is the entire suggest system of this project.

1174

Fig 2.1.4: Suggest system
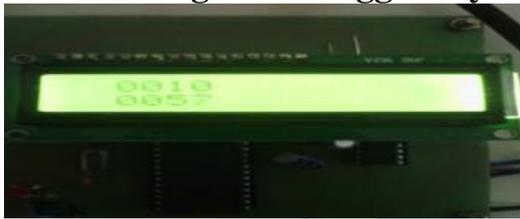
Fig 2.1.5: Determine ment of water emission

The above figure depicts the emission of water variations, if the emission of water exceeds the level 40 it indicates water theft has occurred.

Fig 2.1.6: Mail sending to the user

If the water emission exceeds the level 200 monthly billing can send to the user by GSM. This mail contains billing sum with due date. If the user pay the bill before due date the water feed continued. Otherwise the connection will be discontinued.

CONCLUSION

Enormous growth of developing world has lead to huge need of water. Automated water organization and performance observation system focuses on various entities such as proper feed, over consumption alert and water quality certain. Those factors can be effectively monitored by employing emission sensors with communication of GSM Modem. Suggest system will crenelate precise and real time water billing system. This overemanates existence systems in terms of cost and manpower required. Decreased cost of the whole system will encourage to use as efficient and logical metering system. Monthly billing cycle can be preserved to limit the use of precious natural resource water.

REFERENCES

1. S.-C. Hsia, S.-W. Hsu, Y.-J. Chang," Arrow-Pointer Sensor Design for Low-Cost Water Meter". Published in IEEE SENSORS JOURNAL, VOL. 13, NO. 4, APRIL 2013

2. Liu jie, Li hong-wei, Lv mou, Dong shen," Investigation on Water Recording system for Large User of Water Feed Netprocedure Based on PLC". 1878-0296 © 2011 Published by Elsevier Ltd. Selection and/or peer-review under responsibility of the Intelligent Information Technology Application Research

1175

Association. doi:10.1016/j.proenv.2011.12.155

3. Aditi Dayal, Researcher's "Ensuring Efficient Water Feed" report on Malkapur's 24*7 water feed system. OneWorld.net February2012

4.MaharashtraJeevanPradhikaran..<www.mahamjp.com/newsite/awards/Malkapur_web_eng.pdf

[6] H.G.Rodney Tan, C.H.Lee and V.H.Mok, "Automatic Power Meter Reading System Using GSM Netprocedure ", 8th International Power Engineering Conference (IPEC),pp-465-469, 2007.

[7] Ma Ming, "Design of embedded system application platform based on ARM", Manufacturing Automation, vol.34, pp 15-16, 2012.

[8] Christo Ananth, C.Sudalai @ UtchiMahali, N.Ebenesar Jebadurai, S.Sankari@Saranya, T.Archana, "Intelligent sensor Network for Vehicle Maintenance system", International Journal of Emerging Trends in Engineering and Development (IJETED), Vol.3, Issue 4, May 2014, pp-361-369 [9] Stancil, Stoian and Kovacs, "Urban water feed spread system", vol.3, pp.316-321, 2008.

[10] K.Veeranna Reddy, Y.Tirumala Babu,"A study on auto theft interrogation using GSM", International Journal of Engineering Trends and Technology,vol.2, pp. 60-64, 2011.