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POWER THEFT EXAMINE BASED ON EMBEDDED

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Abstract— Power theft from the power transmission lines by using hooks is very difficult for concern authorities. Existing system Random check up by the lineman at different areas, and it is very difficult to find loop wires, bypass lines at the energy meter. Proposed system we have implemented the system that raises an alarm and displays the power theft area of the distribution transformer at substation by calculating the real consuming power by the energy meter and the main power at the distribution transformer. That means the real consumption of all users must be equals to the total power delivered by the transformer. The difference must be analyzed by the controller by calculating both powers. If the difference is within 2 to 3% variation the system raises no error otherwise it will generates error with an alarm and sends message along with an alarm and sends message along with transformer location information. Here for the practical purpose we have to take transformers, source energy meter, household load, energy meter for measuring real loads along with wired link. If we need we may go for wireless communication between energy meter at the source (distribution transformer) and energy meters at the load. At present nobody is using this particular process in India. It is a useful project for avoiding power thefts due to this we may save revenue around 5 to 10%. In future we may extend the same thing. Information is directly sent to PC or to concern authority via GSM link in the form of SMS.

INTRODUCTION

THE main aim of this paper is to the power theft examine in the power distribution line. This paper is basically designed with MS-51 series 89C52 micro controller. Here we are developing a detection system by using microcontroller MCS 51 to which the assembling program is written for sensing distribution lines power status at different locations. It transmits information to microcontroller via wire line or wireless line.Here for the practical purpose we have to take transformers, source energy meter, household load, energy meter for measuring real loads along with wired link. If we need we may go for wireless communication between energy meter at the source (distribution transformer) and energy meters at the load at present nobody is using this particular process in India. It is a useful project for avoiding power thefts due to this we may save revenue around 5 to 10%. In future we may extend the same thing. Information is directly send to PC or to concern authority via GSM link in the form of SMSThis paper is designed with AT89C52 MICRO CONTROLLER, ADC0809, LCD display, voltage transformer, current transformer etc. Here for the practical purpose we have to take

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transformers, source energy meter, household load, energy meter for measuring real loads along with wired link. If we need we may go for wireless communication between energy meter at the source (distribution transformer) and energy meters at the load. At present nobody is using this particular process in India. It is a useful project for avoiding power thefts due to this we may save revenue around 5 to 10%. In future we may extend the same thing. Information is directly sent to PC or to concern authority via GSM link in the form of SMS.The difference must be analyzed by the controller by calculating both powers.If the difference is within +-2 to 3% variation (transmission losses are concerned) the system raises no error otherwise it will generates error with an alarm and sends message along with an alarm and sends message along with transformer location information.

I.EMBEDDED SYSTEMS

Embedded systems are usually low cost and are easily available off the shelf for most applications. They usually have low design risks, since it is easy to verify the design using tools fuelling the growth of embedded systems.

Embedded systems have received a major shot in the arm as the result of three developments:

- The first was the development of standard run-time platforms like java, which enabled their use in myriad ways that were unimaginable in the past.
- The second was the coming together of embedded systems and the Internet, which made possible the networking of several embedded systems to operate as part of a large system across networks.
- The third was the emergence of several integrated software environments, which simplified the implementations of these applications.

During operation, the design structure may be changed as per our tasks. For example, consider two transistors; we can mould them using other passive elements as emitter coupled circuit, Darlington pair, etc., as per instruction.

II. Working Of The System

The input arc. Supply is stepped down from 230V to 12-0-12V. The rectifier consists of diodes D1 and D2 makes the supply D.C. that is, unidirectional waveform. **The output from rectifier is a URDC, whose value is 12.726V peak to peak.** The voltage regulator makes this URDC to RDC of +5V. The capacitor C1 is used to maintain constant voltage between two consecutive positive cycles where as C2 is used to remove the fluctuations caused by regulator. Here we are selecting 12.726V as a peak value. Because of fluctuations, the peak voltage may decrease, then regulator cannot step up to +5V. A regulated power supply which maintains the output voltage

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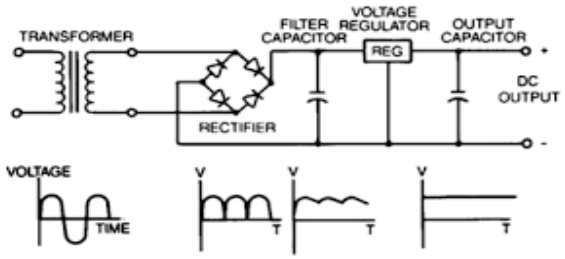
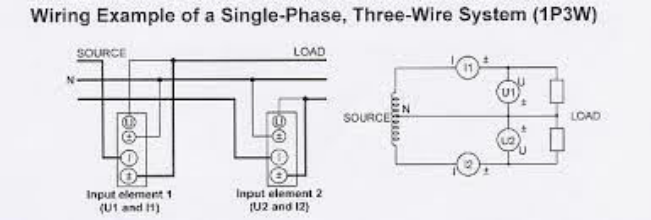
constant irrespective of ac. mains fluctuations or load variations is known as regulated power supply. A regulated power supply consists of an ordinary power supply and voltage regulating device. The output of ordinary power supply is fed to the voltage regulator which produces the final output. The output voltage remains constant whether the load current changes or there are fluctuations in the input ac. Voltage



III.SINGLE-PHASE AND THREE-PHASE POWER MEASUREMENT

In Alternating systems, multiplying volts x amps = volt-amps, also called apparent power. Power consumption is measured by calculating it over time, using at least one complete cycle. Using digitizing techniques, the instantaneous voltage is multiplied by the instantaneous current then accumulated and integrated over a specific time period to provide a measurement. This method provides a true power measurement and true RMS measurements for any waveform, sine or distorted, including harmonic content up to the bandwidth. A three-phase, four-wire system the three wattcmeters each measure voltage from a hot wire to the neutral, and each wattmeter measures current in one of three hot wires. The total power In AC systems, multiplying volts x amps = volt-amps, also called apparent power. Power consumption is measured by calculating it over time, using at least one complete cycle. Using digitizing techniques, the instantaneous voltage is multiplied by the instantaneous current then accumulated and integrated over a specific time period to provide a measurement.



As the name suggests the low power factor meter are the instruments that measures lower values of power factor accurately. Before we study more about the low power factor meter, it is very essential to know why there is a requirement of low power factor meter though we use ordinary electrodynamometer to measure power factor. It is very simple as it gives inaccurate results. Now there are two main reasons that would suggests us that we should not use ordinary wattmeter in measuring the low value of power factor. The value of deflecting torque is very low even though we fully excite the current and pressure coils, Errors due pressure coil inductance.However by doing some modification or adding some new features we can use modified electrodynamics wattmeter or low power factor to measure the low power factor accurately. Here we are going to discuss, where we need to do modification. The electrical resistance of the ordinary wattmeter's pressure coil is reduced to low value such that current in the pressure coil circuit is increased, thus it leads to.With a three-phase, four-wire system the three

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wattcmeters each measure voltage from a hot wire to the neutral, and each wattmeter measures current in one of three hot wires. The total power for the three phases is the algebraic sum of the three wattmeter measurements, as each meter is in essence measuring a single phase of the three-phase system.The total power is the algebraic sum of the two wattmeter readings. Each wattmeter is connected from one of the hot wires to the neutral, and current is measured in each hot wire.Total Power is calculated as Pt = P1 + P2. With a three-phase, four-wire system the three wattcmeters each measure voltage from a hot wire to the neutral, and each wattmeter measures current in one of three hot wires. The total power for the three phases is the algebraic sum of the three wattmeter measurements, as each meter is in essence measuring a single phase of the three-phase system. Approximately 8 to 12 point type.

I. MICRIOCONTROLLER COMPONENT DESCRIPTION

A. Description of AT89C52

The AT89C52 is a low-power, high-performance CMOS 8-bit microcomputer with 4Kbytes of Flash Programmable and Erasable Read Only Memory (PEROM). The device is manufactured using Atmel's high density nonvolatile memory technology and is compatible with the industry standard MCS-51□□instruction set and pin out. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile.

The Atmel AT89C52 is a powerful microcomputer which provides a highly flexible and cost effective solution to many embedded control applications. The AT89C52 provides the following standard features: 8Kbytes of Flash,128 bytes of RAM, 32 I/O lines, two 16-bit timer/counters, five vector two-level interrupt architecture, a full duplex serial port, on chip oscillator and clock circuitry. In addition, the AT89C52 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port and interrupt system to continue functioning. The Power down Mode saves the RAM contents but freezes the oscillator disabling all other chip functions until the next hardware reset.

Port 0

Port 0 is an 8-bit open drain bidirectional I/O port. As an output port each pin can sink eight TTL inputs. When 1s are written to port 0 pins, the pins can be used as high-impedance inputs. Port 0 may also be configured to be the multiplexed low order address/data bus during accesses to external program and data memory. In this mode P0 has internal pull-ups. Port 0 also receives the code bytes during Flash programming, and outputs the code bytes during program verification. External pull-ups are required during program verification.

Port 1

Port 1 is an 8-bit bidirectional I/O port with internal pull-ups. The Port 1 output

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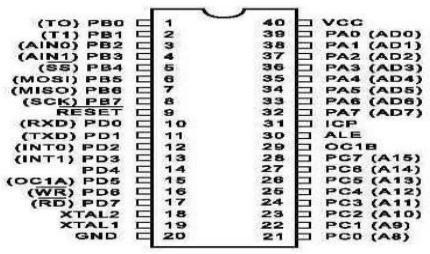
buffers can sink/source four TTL inputs. When 1s are written to Port 1 pins they are pulled high by the internal pull-ups and can be used as inputs. As inputs, Port 1 pins that are externally being pulled low will source current (IIL) because of the internal pull-ups. Port 1 also receives the low-order address bytes during Flash programming and program verification.

Port 2

Port 2 is an 8-bit bidirectional I/O port with internal pull-ups. The Port 2 output buffers can sink/source four TTL inputs. When 1s are written to Port 2 pins they are pulled high by the internal pull-ups and can be used as inputs. As inputs, Port 2 pins that are externally being pulled low will source current (IIL) because of the internal pull-ups. Port 2 emits the high-order address byte during fetches from external program memory and during accesses to external data memory that uses 16-bit addresses (MOVX@ DPTR). In this application it uses strong internal pull-ups when emitting 1s. During accesses to external data memory that uses 8-bit addresses (MOVX @ RI); Port 2 emits the contents of the P2 Special Function Register. Port 2 also receives the high-order address bits and some control signals during Flash programming and verification.



Pin Diagram of AT89C52.

Port 3

Port 3 is an 8-bit bidirectional I/O port with internal pull-ups. The Port 3 output buffers can sink/source four TTL inputs. When 1s are written to Port 3 pins they are pulled high by the internal pull-ups and can be used as inputs.

II.80808ANALOG TO DIGITAL CONVERTER [ADC]

The function of an A/D converter is to produce a digital word which represents the magnitude of some analog voltage or current. Important specification for an A/D converter is its conversion time. This is simply the time it takes the converter to produce a valid output binary code for an applied input voltage. When we refer to converter as high speed, we mean that it has a short conversion time. For an A/D converter with only a positive input range, a straight binary code or inverted binary code is usually used. If the output of an A/D converter is going to drive a display, then it is convenient to have the output coded in BCD.The device ADC 0808 contains an 8-channel single ended signal multiplexer. A particular input channel is selected by using the address decoder . Table shows the input for the address lines to select any channel. The address is latched into the decoder on the low-to-high transform of the address latch enable signal.The heart of this single chip data acquisition system is its analog-to-digital converter. The converter is designed to have fast, accurate and repeatable conversions over a wide range of temperatures. The converter is partitioned into 3 sections: the 256R ladder network, the

successive approximation register and the comparator. The converter's digital outputs are positive true.The 256R ladder cutwork approach was chosen as the conventional R/2R ladder because of its inherent monotonicity, which guarantees no missing digital codes. It is particularly important is closed loop feedback control systems. A non-monotonic relationship can cause relations that will be catastrophic for the system. Additionally, the 256R network does not cause load variations on the reference voltage. The bottom resistor and the top resistor of the ladder network are not the same value as the remainder of the network. The difference in these resistors causes the output characteristics to be symmetrical with zero and full-scale point s of the transfer curve. The successive approximation register (SAR) performs 8 iterations to approximate the input voltage. For any SAR type converter, n-iterations are required for an n-bit converter. The A/D converter's SAR is reset on the positive edge of the start conversion start pulse. The conversion is begun on the falling edge of the start conversion pulse.

II. LIQUID CRYSTAL DISPLAY

Liquid Crystal Displays (LCDs) allow a better user interface, with text messages to enter the instructions and get the response in the form of text and know in a better manner what the machine is doing, including its diagnostics information. This is also helps in fault-findings and debugging. The main advantage of LCD displays is their low power consumption and the speed with which the displayed information is updated. Hitachi 44780 LCD controller provides an easy solution to interface it with microcontrollers.A number of LCD modules can be interfaced this way independent of their manufacturers. Ithas 3 control lines and 8 data lines. The 3 control signals are 'Enable' EN, 'Register Select' RS and 'Read/Write' RW.LCD's operate as a light "valve", blocking light or allowing it to pass through. An image in an LCD is formed by applying an electric field to alter the chemical properties of each LCC (Liquid Crystal Cell) in the display in order to change a pixel's light absorption properties. These LCC's modify the image produced by the backlight into the screen output requested by the controller. Through the end output may be in color, the LCC's are monochrome, and the color is added later through a filtering process. The light source is usually located directly behind the LCD, and can use either LED or conventional fluorescent technology. From this source, the light ray will pass through a light polarizer to uniformly polarize the light.

III. EDITORIAL POLICY

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1) Technical papers submitted for publication must advance the state of knowledge and must cite relevant prior work.
2) The length of a submitted paper should be commensurate with the importance, or appropriate to the complexity, of the work. For example, an obvious extension of previously published work might not be appropriate for publication or might be adequately treated in just a few pages.
3) Authors must convince both peer reviewers and the editors of the scientific and technical merit of a paper; the standards of proof are higher when extraordinary or unexpected results are reported.
4) Because replication is required for scientific progress, papers submitted for publication must provide sufficient information to allow readers to perform similar experiments or calculations and use the reported results. Although not everything need be disclosed, a paper must contain new, useable, and fully described information. For example, a specimen's chemical composition need not be reported if the main purpose of a paper is to introduce a new measurement technique. Authors should expect to be challenged by reviewers if the results are not supported by adequate data and critical details.
5) Papers that describe ongoing work or announce the latest technical achievement, which are suitable for presentation at a professional conference, may not be appropriate for publication in a TRANSACTIONS or JOURNAL.

Conclusion

A Power theft is a common practice especially in remote areas, as they do not pay utility bills to a government company in

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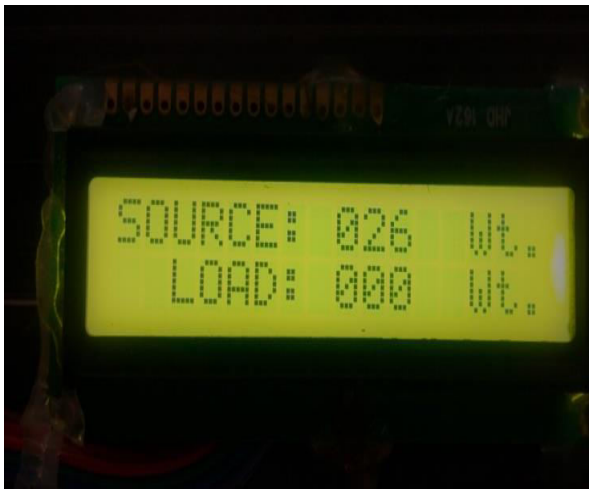
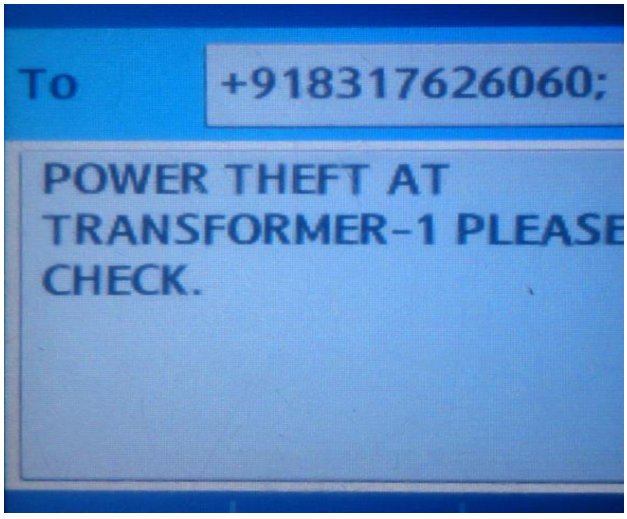
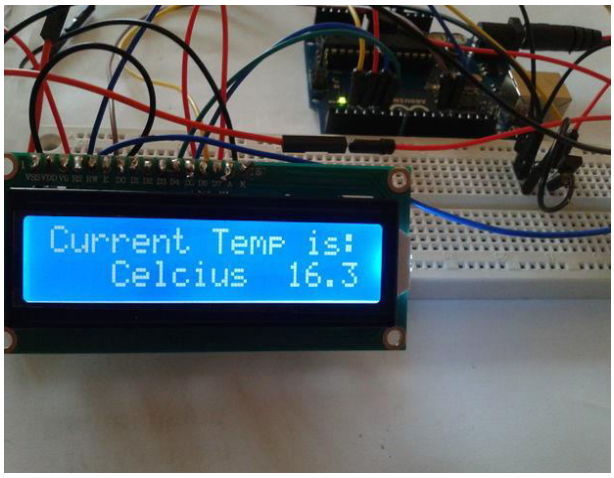
case of electricity and gas as well. To solve these problem governments must think of an idea to provide help in terms of subsidy to manage this issue. With this system these rvice provider can collect the bill any time with a single message. The data collection and manipulation task becomes fast and easier. Any modification can be made to the code in less time. Changes in rate or unit calculation can be done very effectively.

RESULTS







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