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IOT based Motor Monitoring System using ELMEASURE MPU 511**0**

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***Abstract*—A power system should provide uninterrupted supply to its customer according to their requirements. In this endeavor, a protection system must continuously monitor the power system and isolate the faulty sections as soon as possible. At the same time, it must detect the abnormal conditions also and take necessary corrective actions.Coordination of protective relays involves identifying correct set of relays to operate for each possible fault location in the system. It is an important aspect of the protective relaying. relays are good technological and economic option for the protection. So in the system we are go to implement smart relay. Smart Relays are monitor voltages, currents and frequency in the electrical system and send control signals to protective devices such as circuit breakers or switches. Smart relays can store measurement data and process that data to provide utilities with complex information about power system conditions. The settings of smart relays can be adjusted automatically or remotely in response to changing conditions and control instructions. Some smart relays include synchrophasor technology and can act as phasor measurement units .Hence by using the relay we can measure the units in an unaffordable price and smart control techniques.**

I. INTRODUCTION

Nowadays, electric motor has become one of the basic needs in every sector. Thus to improve the efficiency of all electrical appliances and to reduce loss of electric is one of the challenges faced by the world.
The objective is to design and implementation of IOT technology to monitor electric appliances to reduce energy consumption and energy usage in an efficient way.
This IOT based plateform to collect and process the different motor parameters. The collected data can be stored in the cloud plateform and same can be accessed through the web page and also timely alerts will receive for any violation in desired limits of parameters under monitoring, So that immediate action can be taken to avoid unwanted downtime of the loads that saves time and money.
Advantages of this method includes continuous monitoring of the equipment, receiving alerts and data availability for predictive maintenance.

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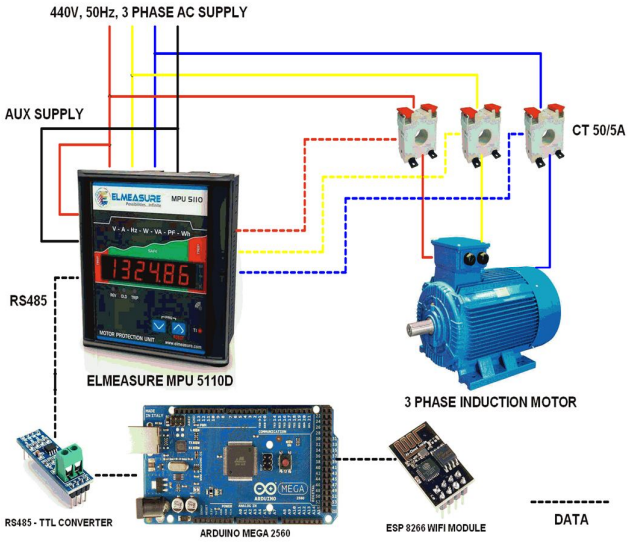
II. BLOCK DIAGRAM



III. METHODOLOGY

Motor metering, or dense circuit metering enables users to meter multiple circuits together in close proximity. This form of metering offers a refined, granular view of how energy is consumed over multiple circuits in a home or building. Motor monitoring is typically found when an application calls for the monitoring of individual motors, rather than the whole panel such as HVAC systems. This method allows for segregation of multiple users, tenants or devices.

Accuenergy meters are capable of metering branch circuits through the use of a single meter without sacrificing the accuracy or integrity of each individual measurement.

These meters offer a variety of communication features that provide ease-of-access to readings and reporting. ESCO's can aid their clients in the deployment of branch circuit solutions.

Motor production system allows commercial facilities to monitor . Motor production system allows these facilities to directly monitor the specific motor.

IV. ELMEASURE MPU 5110D

A. Features

- User programmable password protection.
- Auto-scaling of Kilo, Mega, Giga and decimal point.
- Auto scrolling.
- Finger touch proof terminals for voltage and current connections.
- Communication with PCs, PLCs, DCS through optional RS 485/232 serial interface.
- Potential free output with programmable trip time for protection.
- Displays more than 25 parameters Basic (VLL, VLN, A, Hz); Power (W,VA, PF) and Energy (kW, Load Hours).
- Displays the reasons for tripping for future correction.
- Programmable start time from sensing safe condition.
- Programmable locked rotor current and time.

B. Technical Specification

Accuracy

- Class 1.0 (Default) as per IEC 62053-21,
- Class 0.5 as per IEC 62053-22 (Optional).

Sensing\Measurement

- True RMS, 1 Sec update time; 4 Quadrant Power & Energy

Input voltage

- 4 Voltage inputs (VR, VY, VB, VN) Programmable 110 or 415V LL Nominal (Range 80 to 550V LL)Primary Programmable up to 999 kV. Burden: 0.2VA Max. per phase.

Input Frequency

- 45 - 65 Hz Input current: Current inputs [AR, AY, AB]. Primary Programmable up to 99 kA.
- CT-output : Can be upto 1000 mV or 100 mA from Split core CT or Hanging CTs - Manufacturing option.

Input Current

- Current inputs (AR, AY, AB) 50mA - 6A (Field configurable 1A or 5A)Primary Programmable up to 99 kA.
- Overload: 10A max continuous, 50A max for 3 sec.
- Burden: 0.2VA Max. per phase.

Aux-Supply

- (Control Power): 80 - 300V AC / DC, 40-70Hz.
- Burden: 5VA Max.

CT PT Ratio Max

- 2000 MVA Programmable.

Communication

- RS485 interface. Industry standard Modbus RTU protocol.
- Baud rate: 4800 bps to 19200 bps. (Preferred 9600 bps)
- Isolation: 2000 volts AC isolation for 1 minute between communication and other circuits.

Weight

- Unpacked: 250 gms
- Packed: 350 gms (varies with CT)

V. RESULT

Industrial and manufacturing facilities typically have massive energy needs, for this reason it's important that facility managers and engineers understand their energy needs in greater detail.
Branch circuit monitoring allows industrial facilities to meter individual circuits, common loads, and even individual pieces of manufacturing equipment. This level of detail provides the data needed to truly understand their energy usage.
A branch circuit monitor includes a plurality of non-contact current sensors arranged to sense current on each of a plurality of branch circuits, the non-contact current sensors being connected to a common digital signal processor (DSP) module having as inputs the outputs of the current sensors and also voltage inputs from each power source.
The digital signal processor is arranged to calculate not only overall energy consumption, but also RMS voltage, RMS current, power factor, real power, and/or apparent power for each branch circuit. Data from the digital signal processor may be made available via communications protocols such as Modbus RTU or RS232/RS485/422, to any number of remote sites.
The individual branch circuit monitors can be wired in a daisy chain or star network configuration and even connected to the Internet via an appropriate interface device.

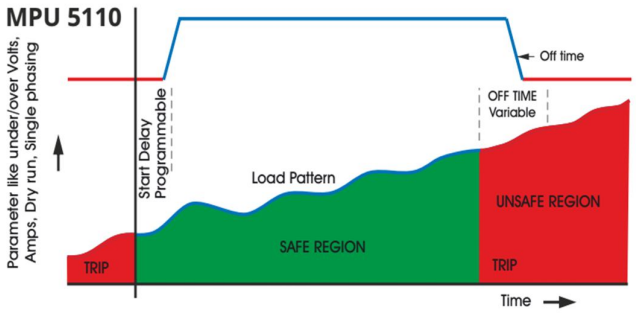
VI. UNIQUE FEATURES

- True RMS measurements.
- Simultaneous sampling of volts & amps.
- Best parameters grouping & bright displays.
- Upgradable to higher versions.
- Auto-scaling of kilo, mega, &giga decimal point.
- Single channel current and voltage input.

VII. Enabling and Disabling of Auto Scrolling

Enabling auto scrolling: Press Down key continuously for 5 seconds or until display shows for scrolling. Display starts to scroll pages in downward direction for the enable set Auto scroll time and different parameters can be viewed for the selected Channel.
Disabling auto scrolling: Press any key (UP/DOWN) display showdisableand returns tonormal mode.

VIII. Operational Diagram for MPU



IX. Conclusion

A power system should provide uninterrupted supply to its customer according to their requirements. In this endeavor, a protection system must continuously monitor the power system and isolate the faulty sections as soon as possible. At the same time, it must detect the abnormal conditions also and take necessary corrective actions. Coordination of protective relays involves identifying correct set of relays to operate for each possible fault location in the system. It is an important aspect of the protective relaying. relays are good technological and economic option for the protection. So in the system we are go to implement smart relay. Smart Relays are monitor voltages, currents and frequency in the electrical system and send control signals to protective devices such as circuit breakers or switches.

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