Implementation of IoT Based Poultry Feeder Box

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***Abstract*- The present study has been undertaken to examine various aspects related to the growth and development of poultry production in the country. Poultry production in India was confined to backyards till recently. In poultry, feeding the fodder to the broiler breeders is very bulky and hard. The broiler breeders take the fodder in large amount of quantity. In present, the worker took the fodder in basin box and feed to the feeder box. The worker should pick up the fodder frequently to feed few poultries. Due to this frequent work, it leads to consume more man power and he feels pain. The problems are Frequent Feeding, More time consumption, Health issues .The proposed work is to eliminate the frequent work and feed the poultry in large quantity in less time. The proposed work is eco-friendly and user friendly. It makes the worker to feed the poultries in large scale at a single pickup. The work is to eliminate manpower, to avoid frequent feeding, to save time. So it leads to reduce the work rate and minimize the time.**

***Index terms*- Power supply, Transformer, Bridge Rectifier, Solar Panel, Boost Converter, Direction Controller**

I.INTRODUCTION

Poultry meat is an important source of high quality proteins, minerals and vitamins to balance the human diet. Specially developed varieties of chicken (broilers) are now available with the traits of quick growth and high feed conversion efficiency. Depending on the farm size, broiler farming can be a main source of family income or can provide subsidiary income and gainful employment to farmers throughout the year. Poultry manure is of high fertilizer value which can be used for increasing yield of all crops. Poultry farming is the form of husbandry which raises domesticated birds such as chicken, ducks, and turkeys to produce meat or eggs for food. Poultry mostly chickens are formed great numbers. Farmers raise more than 50 billion chickens annually chickens raised for eggs are known as layers, while chickens raised for meat are called broilers.

Poultry feeding is associated with a variety of environment nutrients specifically nitrogen and phosphorus antibiotics and pesticides and hormones. It is very difficult to feed the poultry frequently. The chickens taking their fodder respectively to their size. The fodder containers have a limit for feeding nearly a few chickens. In the current feeding method, the worker takes up the feeder container and he needs to feed the broilers frequently. Due to their frequent work it leads to consuming more manpower in poultry farming feeding the boilers is the bulky process.

II.BUILDING BLOCKS

A. Power Supply

A power supply is an electrical device that supplies electric power to an electrical load. The primary function of a power supply is to convert electric current from a source to the correct voltage, current, and frequency to power the load. As a result, Examples of the latter include power supplies found in desktop computers and consumer electronics devices.

B. Transformer

A Step down Transformer is a device which converts high primary voltage to a low secondary voltage. In a Step down Transformer, the primary winding of a coil has more turns than the secondary winding.

Winding representation of a typical Step- down Transformer.

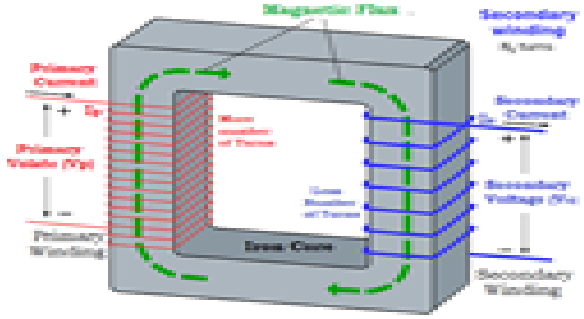

Fig.1. Transformer

The number of turns in secondary winding should always be less than the number of turns in the primary winding of the transformer i.e Np>Ns to work transformer as step-down transformer.

C. Bridge Rectifier

A diode bridge is an arrangement of four (or more) diodes in a bridge circuit configuration that provides the same polarity of output for either polarity of input. When used in its most common application, for conversion of an alternating-current (AC) input into a direct-current (DC) output, it is known as a bridge rectifier. A bridge rectifier provides full-wave rectification from a two-wire AC input, resulting in lower cost and weight as compared to a rectifier with a 3-wire input from a transformer with a center-tapped secondary winding.

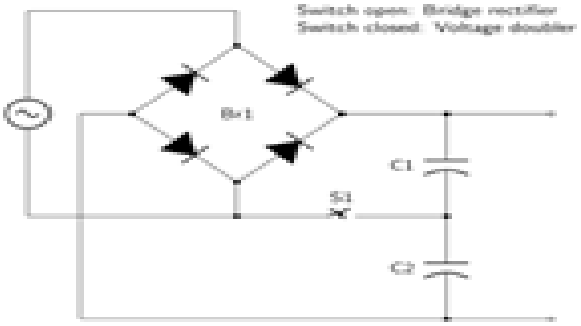

Fig 2. AC to DC Bridge Rectifier

According to the conventional model of current flow (originally established by Benjamin Franklin and still followed by most engineers today current flows through electrical conductors from the positive to the negative pole (defined as "positive flow"). In actuality, free electrons in a conductor nearly always flow from the negative to the positive pole. In the vast majority of applications, however, the actual direction of current flow is irrelevant. Therefore, in the discussion below the conventional model is retained. The fundamental characteristic of a diode is that current can flow only one way through it, which is defined as the forward direction. A diode bridge uses diodes as series components to allow current to pass in the forward direction during the positive part of the AC cycle and as shunt components to redirect current flowing in the reverse direction during the negative part of the AC cycle to the opposite rails.

D. Solar Panel

Photovoltaic solar panels absorb sunlight as a source of energy to generate direct current electricity. A photovoltaic (PV) module is a packaged, connected assembly of photovoltaic solar cells available in different voltages and wattages. Photovoltaic modules constitute the photovoltaic array of a photovoltaic system that generates and supplies solar electricity in commercial and residential applications. Figure shows Solar cell & PV system.

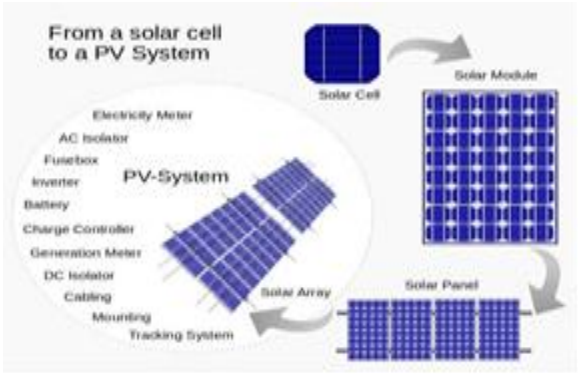

Fig 3. Solar cell & PV system

Photovoltaic modules use light energy (photons) from the Sun to generate electricity through the photovoltaic effect. Most modules use wafer- based crystalline silicon cells or thin-film cells. The structural (load carrying) member of a module can be either the top layer or the back layer. Cells must be protected from mechanical damage and moisture. Most modules are rigid, but semi-flexible ones based on thin-film cells are also available. The cells are connected electrically in series, one to another to a desired voltage, and then in parallel to increase amperage. The wattage of the module is the mathematical product of the volt1age and the amperage of the module.

E. Boost Convertor

Power for the boost converter can come from any suitable DC source, such as batteries, solar panels, rectifiers, and DC generators. A process that changes one DC voltage to a different DC voltage is called DC to DC conversion. A boost converter is a DC to DC converter with an output voltage greater than the source voltage. A boost converter is sometimes called a step-up converter since it "steps up" the source voltage. Since power (p=vi) must be conserved, the output current is lower than the source current.

Fig 4. Boost Convertor

The NHW20 model Toyota Prius HEV uses a 500 V motor. Without a boost converter, the Prius would need nearly 417 cells to power the motor. However, a Prius actually uses only 168 cells and boosts the battery voltage from 202 V to 500 V. Boost converters also power devices at smaller scale applications, such as portable lighting systems. A white LED typically requires 3.3 V to emit light, and a boost converter can step up the voltage from a single 1.5 V alkaline cell to power the lamp.

F. Radio Frequency Transmitter and Receiver

An RF transmitter receives serial data and transmits it wirelessly through RF through its antenna connected at pin4. The transmission occurs at the rate of 1Kbps – 10Kbps. The transmitted data is received by an RF receiver operating at the same frequency as that of the transmitter.

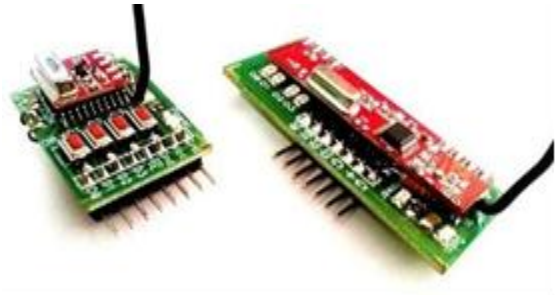

Fig 5.RF Transmitter & Receiver 433MHz with Encoder and Decoder

An RF module (short for radio-frequency module) is a (usually) small electronic device used to transmit and/or receive radio signals between two devices. In an embedded system it is often desirable to communicate with another device wirelessly. This wireless communication may be accomplished through optical communication or through radio-frequency (RF) communication. For many applications, the medium of choice is RF since it does not require line of sight. RF communications incorporate a transmitter and a receiver. They are of various types and ranges. Some can transmit up to 500 feet. RF modules are typically fabricated using RF CMOS technology.

G. Motor Drive

A motor drive, in the field of photography, is a powered film transport mechanism. Historically, film loading, advancing, and rewinding were all manually driven functions. The desires of professional photographers for more efficient shooting, particularly in sports and wildlife photography, and the desires of amateur and novice photographers for easier to use cameras both drove the development of automatic film transport. Some early developments were made with clockwork drives, but most development in the field has been in the direction of electrically driven transport. L298N Dual H Bridge DC Stepper Motor Drive Controller Board Module for Arduino as shown in Figure.

Fig 6. L298N Dual H Bridge DC Stepper Motor Drive Controller Board Module for Arduino

H. Brushless DC Electric Motor

A brushless DC electric motor (BLDC motor or BL motor), also known as electronically commutated motor (ECM or EC motor) and synchronous DC motors, are synchronous motors powered by direct current (DC) electricity via an inverter or switching

power supply which produces an alternating current (AC) electric current to drive each phase of the motor via a closed loop controller. The controller provides pulses of current to the motor windings that control the speed and torque of the motor.

Fig 7. Brushless DC electric motor

I. Servo Motor

A servomotor is a rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity and acceleration. It consists of a suitable motor coupled to a sensor for position feedback. It also requires a relatively sophisticated controller, often a dedicated module designed specifically for use with servomotors. Servomotors are not a specific class of motor, although the term servomotor is often used to refer to a motor suitable for use in a closed-loop control system. Servos are used in radio-controlled airplanes to position control surfaces like elevators, rudders, walking a robot, or operating grippers. Servo motors are small, have built-in control circuitry and have good power for their size. Figure shows variable Pulse width control servo position.

Fig.8.Hadware Setup

IV.CONCLUSION

The proposed work we play Vidal roll in future. It will save the time by eliminating man power. It is user friendly and ecofriendly. The increasing demand for poultry products has transformed poultry production activity into a full-fledged industry from a mere household/backyard activity until recently. Technological advances have revolutionized the role and the structure of poultry industry in India. The distribution of the poultry population suggests that it is concentrated in some limited pockets.

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