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Implementation Of Rfid & Load Cell Based Automatic Weight Monitoring With Streaming Image Sequence Via E Mail System

M.Lakshmi , K. Hari prasadh

Abstract— The world is flourishing with new innovation in the field of science and technologies. Heavy vehicle transportation plays a major role in our country. Heavy vehicle owners and drivers in our country face deaths, injuries and loss of goods. The main reasons for road accident , stealing of goods, adding Drugs in the goods in midway.In our project implementation of tollgate based RFID technology to gather information of vehicle such as registration number, driver & client details etc. A IR sensor is installed on two corner on the field in order to position vehicle for getting the information of load weight through load cell, after positioning the vehicle with camera is invoked through which front image of vehicle is captured and information such as vehicle detail, load weight, image of vehicles are saved in computer and send as mail to client, with the data client can cross verify the details regarding the transportation. By means of providing proper monitoring & tracking system of the vehicle and for assurance of safe transport and to protect from theft of goods certain precaution are taken to avoid client receiver loss. In Tollgate we have attached card swiping system for paying the toll amount. Based on the vehicle amount will be charged.

I. INTRODUCTION

Now a large majority of freight transportation is made by road in most countries, and the volume of ground transportation is keep increasing as the result of the fast growing industry and commerce. The vehicles are fully loaded trucks and their gross weights. Recently, there have been a significant number of vehicles illegally overloaded and damage vehicles.

With developing the highway, transportation and business trade, vehicle weight-in-motion technology has become a key technology and trend of measuring weight of the loads. Moreover, because of the strong competition between transport modes and companies, transportation management was improved, which has led to an increase in the numbers of fully loaded trucks and their gross weights.

II. AIM AND SCOPE OF PRESENT INVESTIGATION

The main aim of this paper is to reduce theft and traffic. Load cell can be used to measure the weight of vehicles.

M.Lakshmi , PG Scholar in the Department of Mechanical Engineering in Jeppiaar Engineering College, Jeppiaar Nagar, Rajiv Gandhi Salai, Chennai-119 (Email:lakshmiece2k14@gmail.com)

K. Hari prasadh , Assistant Professor in the Department of Mechanical Engineering in Jeppiaar Engineering College, Jeppiaar Nagar, Rajiv Gandhi Salai, Chennai-119 (Email:lakshmiece2k14@gmail.com)

III. PROPOSED METHODOLOGY

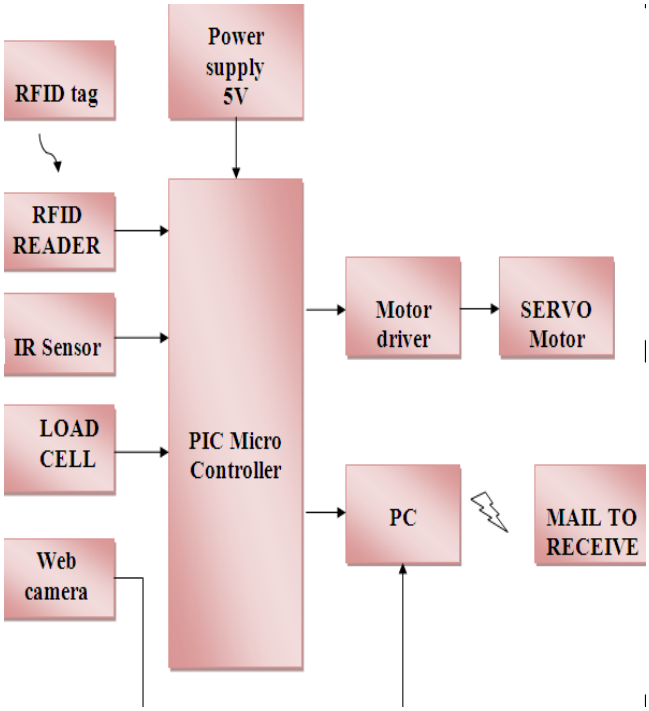
A. Existing System

The goods transportation import and export process is carried out by means of manual paper work regarding the overall shipment and vehicle details, are gathered through manual paper work in the overall goods transportation.

B. Proposed System

In this proposed system managing and monitor the vehicle details to avoid unethical activities such as overloading and goods theft. Due to overloading they gain extra money but the safety of the driver cannot be assured so to avoid accident and to reduce the unethical activities, In this project RFID tags are used for gathering the information of the vehicle which is installed in vehicle through RFID reader, information such as vehicle number, driver information, receiver address are obtained through RFID reader, IR sensor installed in field around the Two corner of vehicle which helps in positioning the vehicle after positioning the gate is closed, for weighting load to gather information regarding the imported load. After positioning the vehicle, camera is invoked by IR sensor and the front image of the vehicle is captured and the details such as weight, receiver address, and the vehicle details with image is stored in PC and sent to the receiver through mail with the received information the cross verification in receiver side is made possible.

C. Block diagram



PIC16F877A:

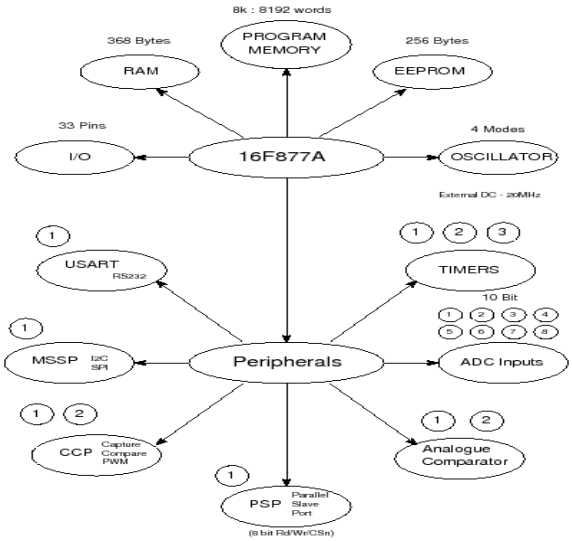


Fig 1 : PIC Microcontroller

It is High performance RISC CPU machine. ONLY have 35 simple word instructions. Operating speed: clock input (200MHz), instruction cycle (200nS).Up to 368×8bit of RAM (data memory), 256×8 of EEPROM (data memory), 8k×14 of flash memory. Wide operating voltage range (2.0 – 5.56) volts.2 8 bit timer and one 16 bit timer is available10bit multi-channel A/D converter Synchronous Serial Port (SSP) with SPI (master code) and I2C (master/slave). 100000 times erase/write cycle enhanced memory.1000000 times erase/write cycle data EEPROM memory.

POWER SUPPLY CIRCUIT

The hardware of project requires different power supplies. 5 v. the interfacing devices will get the supply from main microcontroller.

Fig 2: powersupply

LCD:

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.

Fig 3: Lcd display

MAX232

MAX232 is used to convert TTL into RS232 logic level converter used between the microcontroller and the GSM board or PC .Our controller is operated at 5v but interfacing devices are worked with 12 v .so this IC will convert the level of 5v to 12 v for transmitting . while receiving convert 12v into 5v to the microcontroller.

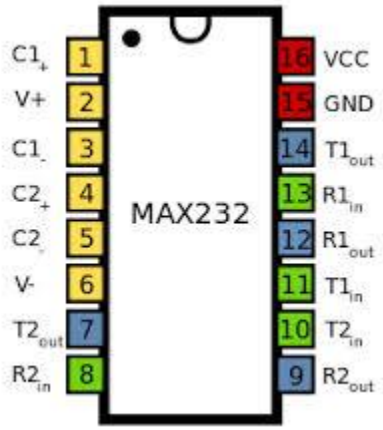


Fig 4 : MAX 232

IR SENSOR

The IR sensor is a very simple device that works by reflecting infrared light off of an object and detecting the reflecting with a photo-transistor that is tuned to the same frequency of light.

The LED is mounted next to the photo-transistor; however, the emitted light from the LED does not directly shine into the photo-transistor. Appropriate values for resistance are in series with both the LED to limit current and the photo-transistor in order to show a voltage drop based on distance to the object in front of the sensor. The effective range of the sensor is a few centimeters. Object detection can be enhanced by placing a reflective surface between the object and the sensor. When the object passes between the sensor and reflective surface, a large drop will be observed in the output signal.

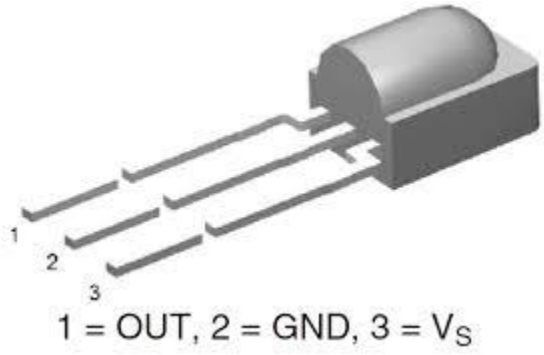


Fig 5 : IR sensor

RFID

"RFID" stands for Radio Frequency Identification. The tag's antenna picks up signals from an RFID reader or scanner and then returns the signal, usually with some additional data (like a unique serial number or other customized information). RFID system consists of three components: an antenna or coil, a transceiver (with decoder) and a transponder (RF tag) electronically programmed with unique information. An RFID reader is a device that is used to interrogate an RFID tag. The reader has an antenna that emits radio waves; the tag responds by sending back its data.

SERVO MOTOR

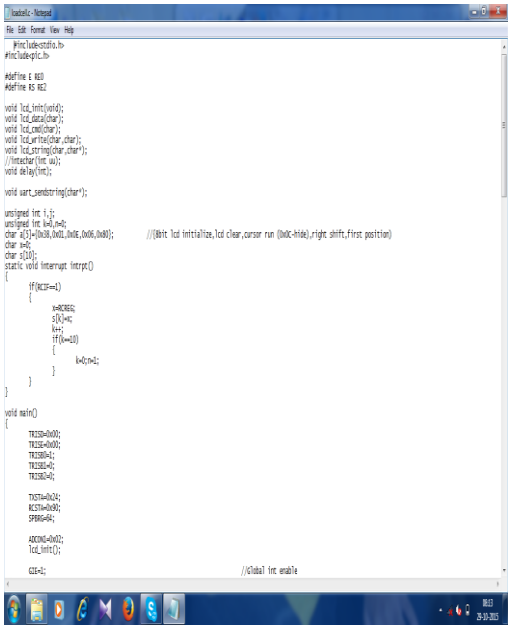
A Servo is a small device that has an output shaft. This shaft can be positioned to specific angular positions by sending the servo a coded signal. As long as the coded signal exists on the input line, the servo will maintain the angular position of the shaft. As the coded signal changes, the angular position of the shaft changes. In practice, servos are used in radio controlled airplanes to position control surfaces like the elevators and rudders. They are also used in radio controlled cars, puppets, and of course, robots, gate application.

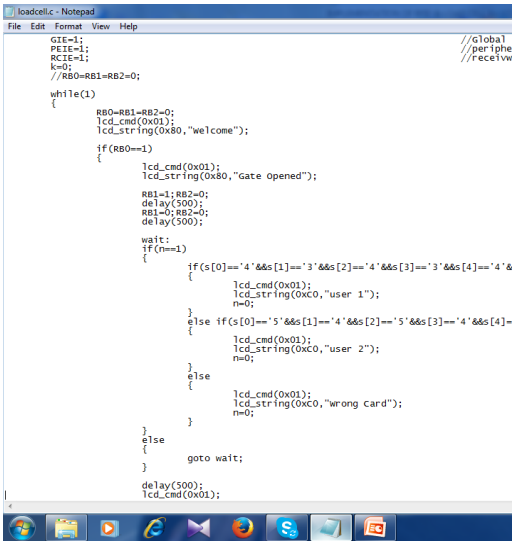
LOAD CELL

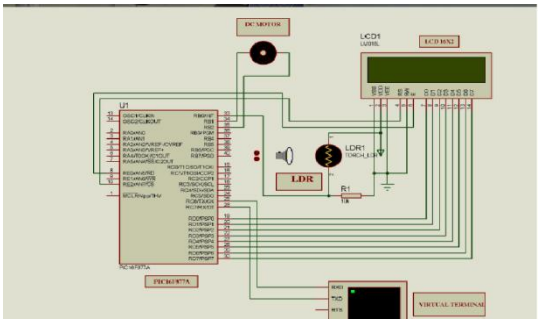
A load cell is a sensor or a transducer that converts a load or force acting on it into an electronic signal. This electronic signal can be a voltage change, current change or frequency change depending on the type of load cell and circuitry used. There are many different kinds of load cells. We offer resistive load cells and capacitive load cells.

IV. SOFTWARE PROGRAM TESTING

The software program is written in EMBEDDED 'C' language and compiled by HI-TECH C compiler using MPLAB IDE software. The compiler is used to convert middle level language into machine level language. After compiler operation the hex code is generated and stored in the computer. The hex is nothing but machine level language understands by the micro controller. The hex code of the program is burnt into the ROM (Flash memory) of PIC16F877A by using PICKIT2 Programmer.







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