**Live Stock Monitoring System using VSD Squadron mini board**

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## Introduction

The livestock monitoring has become one of the strongest pillar in the modern animal husbandry. Livestock industries evolving since a decade and even technology is playing major role in uplifting the industry. Cattle, poultry and other animals require optimal living conditions to stay healthy and maximize yield. If the fan is turned off suddenly or there is no circulation of air or lack of ventilation during the absence of the people looking after these cattle or the livestock animals the disaster occurs along with the huge loss of lives innocent animals.

This technology using VSD Squardon mini board and smart devices have made considerable transformation in sectors like farming and livestock. This has brought new trend the way the life stock industry works. This in return ultimately uses the battery power, sensors and smart devices making the farmer keep the track of the livestock without running around them remotely. Livestock industry is growing at a rapid phase hands keeping the track of livestock and other farm animals is very crucial.

Livestock monitoring system is revolutionizing from years to years with the solution in architecture and developed using GPS sensors and many more Technology. This also keep the track of the animal shipping pattern, location details animal health issues management etc.

This application also provide support to the farmer if you lose his animal or in case if it is stolen.

Suppose if there is a poor ventilation, high humidity levels or high CO2 levels and even the rising or falling of a temperature also affect the living of these livestock adversely. To overcome such challenges we have brought up livestock monitoring system using VSD Squardon mini board.

This keeps operation running smoothly remotely and also ensures the safety of animals. We can also call this as a auto dialler that is detecting issues in a initial stage to prevent massive life stock loss.

In order this also enhances of farmers business. The implement of such a technologies has a put forth animals being tagged for purpose such as disease control livestock management and also breeding management.

## Overview

To ensure the overall well-being of animals. With greater advancement in technology and implementation of VSD Squardon mini board the livestock monitoring system aims at tracking and managing the health behaviour of all animals and to find out the local exact location of animals in real time. The VSD Squardon mini board is more versatile and is a compactly developed platform for designing the various monitoring and controlling applications that also includes the implementation of livestock monitoring system.

This system offers a y-inch range of features to uprising the animal welfare. We are the VSD Squardon mini board acts effectively and efficiently in livestock monitoring system.

Livestock monitoring system that utilizes VSD Squardon mini board comes up with various

steps starting from prioritizing the use of sensors and microcontrollers that are evolving the scheme to accumulate and resolve various challenges that need to be faced.

We need to begin with the gathering of components such as VSD Squardon mini-board, Various sensors including temperature sensor, humidity sensor motions sensor. Also require GPS for the location tracking and communication model. Additional power supply is indeed.

Secondly we need to install essential libraries examples DHT for dampness and hotness for sensors , Tiny GPS ++ for GPS and also Adafruit Sensor.

You need to write a code or a program who interface this on hardware board that is VSD Squardon mini board.

This ultimately leads in the monitoring of livestock and helping both animals and farmers.

## Component required

* VSD Squadron mini board

* GPS Module

* RFID Reader

* LCD Display

* Power supply

* Temperature sensor -DS18B20

* Pulse sensor

* MPU6050 Accelerometer

* I/I ports for interfacing

* Environmental sensors

## Software Required

* Embedded system Software for VSD Squadron mini board.

* Arduino

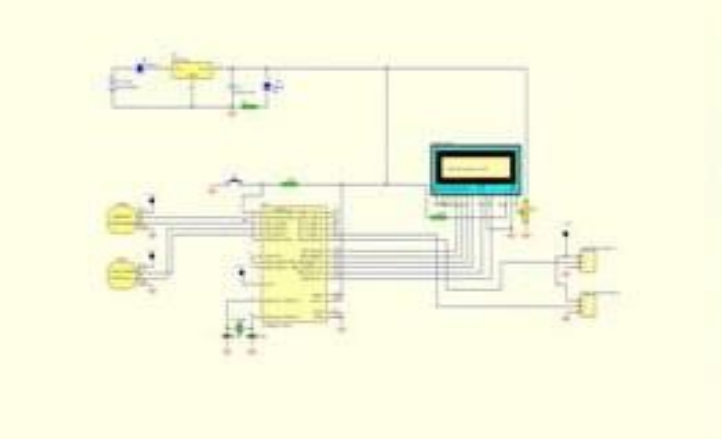
* Firmware for data collection and transmission

* Cloud based platform for data analysis and visualization.

## Table for pin connection

| **Sensor/Actuator** | **Pin on VSDSquardon Mini Board** |
|---|---|
| Temperature Sensor | Analog Pin |
| Humidity Sensor | Analog Pin |
| Light Sensor | Analog/Digital Pin |
| CO2 Sensor | SDA/SCL Pins (I2C) |
| Fan/Heater | Digital Pin |

**Circuit connection diagram**



## Design of project

Livestock monitoring system using VSDSquardon mini board creating a each detail

of the project that covers software development, hardware interfacing or debugging on hardware and data management and it is also user interface comprehensive design to be guided.

This leads implementation of livestock monitoring system in real time .

Firstly the various components are gathered like VSD Squardon mini board, power supply , data storage and processing units.

Sensor to the data by using sensors for that certain libraries and installed then the data processing takes place. This is done by implementing algorithms to process raw sensor data. Next the data is transmitted to the cloud flat form using GSM/ GPRS or LoRa model.

This ensures the safety along with health condition of animals and monitors the livestock.

## Working code

```
#include <TinyGPS++.h>
#include <OneWire.h>
#include <DallasTemperature.h>
#include <Wire.h>
#include <Adafruit_Sensor.h>
#include <Adafruit_ADXL345_U.h>
#include <SoftwareSerial.h>


#define ONE_WIRE_BUS 2 // DS18B20 data pin
#define ESP8266_TX 10 // ESP8266 TX pin
#define ESP8266_RX 11 // ESP8266 RX pin


TinyGPSPlus gps;
OneWire oneWire(ONE_WIRE_BUS);
DallasTemperature sensors(&oneWire);
Adafruit_ADXL345_Unified accel = Adafruit_ADXL345_Unified(12345);
SoftwareSerial esp8266(ESP8266_TX, ESP8266_RX);


void setup() {
  Serial.begin(115200);
  Serial1.begin(9600); // GPS module
  sensors.begin();
  accel.begin();
  esp8266.begin(115200);


  // Initialize Wi-Fi module
  esp8266.println("AT");
  delay(1000);
  esp8266.println("AT+CWMODE=1");
  delay(1000);


esp8266.println("AT+CWJAP=\"yourSSID\",\"yourPASSWORD\"");
  delay(5000);
}


void loop() {
  // Read GPS data
  while (Serial1.available() > 0) {
    gps.encode(Serial1.read());
  }


  // Read temperature data
  sensors.requestTemperatures();
```

```
  float temperatureC = sensors.getTempCByIndex(0);

  // Read accelerometer data
  sensors_event_t event;
  accel.getEvent(&event);
  float accelX = event.acceleration.x;
  float accelY = event.acceleration.y;
  float accelZ = event.acceleration.z;

  // Check if new GPS data is available
  if (gps.location.isUpdated()) {
    float latitude = gps.location.lat();
    float longitude = gps.location.lng();

    // Construct data string
    String data = "lat=" + String(latitude, 6) +
                  "&lon=" + String(longitude, 6) +
                  "&temp=" + String(temperatureC) +
                  "&accelX=" + String(accelX) +
                  "&accelY=" + String(accelY) +
                  "&accelZ=" + String(accelZ);

    // Send data to cloud
    sendDataToCloud(data);
  }

  delay(2000); // Adjust delay as needed
}

void sendDataToCloud(String data) {

  esp8266.println("AT+CIPSTART=\"TCP\",\"your.server.com\",80");
  delay(2000);
  esp8266.print("AT+CIPSEND=");
  esp8266.println(data.length() + 17); // Adjust length for HTTP POST request
  delay(1000);
  esp8266.print("POST /data HTTP/1.1\r\n");
  esp8266.print("Host: your.server.com\r\n");
  esp8266.print("Content-Type: application/x-www-form-urlencoded\r\n");
  esp8266.print("Content-Length: ");
  esp8266.println(data.length());
  esp8266.print("\r\n");
  esp8266.print(data);
  delay(1000);
  esp8266.println("AT+CIPCLOSE");
}
```