Gsm Based Smart Wireless Network For Monitoring Agriculture

Environment : PIC16f877a , Android.
Language : Embedded C.
Tools used : Mplab Ide , Proteus.

Project Description :

- In view of preventing agricultural crops from the damage caused by wild animals and climatic changes.
- Using pir sensor/ ultrasonic sensor any object or animals near the land is detected and datas will be immediatly send to the microcontroller, from where the information is send to owner of land or forest authorities via gsm.
- Similary, humidity sensors detect the abrubt climatic changes and gives data to the controller. So immediate controls such as turning on and off of motors in dry condition is carried out successfully.
- So the owners can prevent their land from climatic changes and avoid much damage made by the animals.

PIR-Sensor :

- PIR sensor allows you to sense motion, almost always used to detect wheather.human has moved in or out of the sensor range.
- They are often referred to as PIR, "Passive-Infrared", "Pyroelectric", or "IR motion" sensors.
- The PIR sensor itself has two slots in it, each slot is made of a special material that is sensitive to IR.
- When the sensor is idle, both slots detect the same amount of IR, the ambient amount radiated from the
- room or walls or outdoors. When a warm body like a human or animal passes by, it first intercepts one half of the PIR
- sensor, which causes a positive differential change between the two halves.
- Sensitivity range: up to 20 feet (6 meters) 110° x 70° detection range

Power supply: 5V-12V input voltage for most modules (they have a 3.3V regulator), but 5V is ideal in case theregulator has different specs

PIR-Module :

Ultrasonice-sensor :

- The HCSR04 ultrasonic sensor uses sonar to determine distance to an object like bats or dolphins do.

- From 2cm to 400 cm or 1” to 13 feet.It comes complete with ultrasonic transmitter and receiver module.

- The timing diagram of HCSR04 is shown. To start measurement, Trig of SR04 must receive a

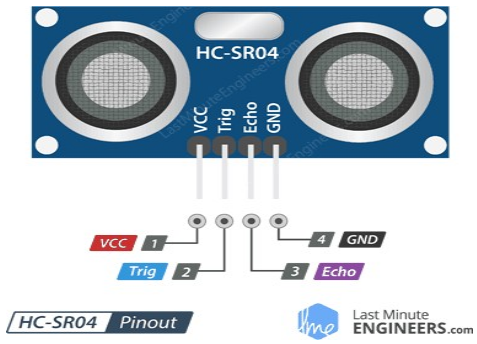
- pulse of high (5V) for at least 10us, this will initiate the sensor will transmit out 8 cycle of ultrasonic

- burst at 40kHz and wait for the reflected ultrasonic burst. When the sensor detected ultrasonic from

- receiver, it will set the Echo pin to high (5V) and delay for a period (width) which proportion to

➢ distance. To obtain the distance, measure the width (Ton) of Echo pin.
➢ Time = Width of Echo pulse, in uS (micro second)
➢ Distance in centimeters = Time / 58
➢ Distance in inches = Time / 148
➢ Or you can utilize the speed of sound, which is 340m/s

Ultrasonic-sensor Modules:



GSM-MODULES:

- A GSM modem is a wireless modem that works with a GSM wireless network.
- A wirelessmodem behaves like a dial-up modem. The main difference between them is that a dial-up
- modem sends and receives data through a fixed telephone line while a wireless modem sends and
- receives data through radio waves. Like a GSM mobile phone, a GSM modem requires a SIM
- card from a wireless carrier in order to operate. GSM sim 800C Modem can accept any GSM
- network operator SIM card and act just like a mobile phone with its own unique phone number
- Applications like SMS Control, data transfer, remote control and logging can be developed easily.

- SMS messages.
- Reading, writing and searching phone book entries.
- Monitoring the charging status and charge level of the battery.
- MSendingonitoring the signal strength.

GSM-MODULES:

Lcd-Display:

- One of the most common devices attached to a Microcontroller is an LCD display.

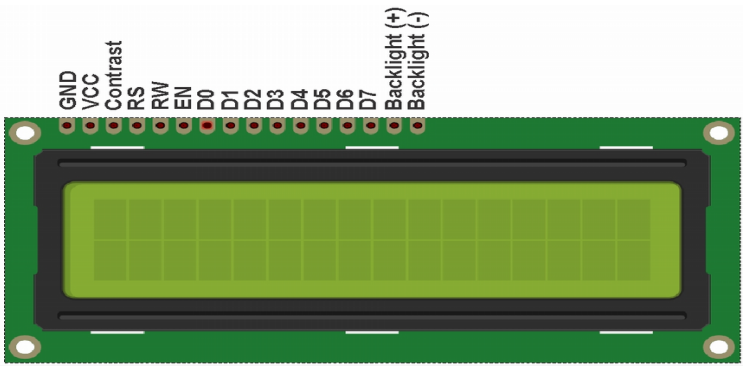
- Some of themost common LCDs connected to the controller are 16x2 and 20x2 displays.

- This means 16characters per line by 2 lines and 20 characters per line by 2 lines, respectively.

- In recent yearsthe LCD is finding widespread use replacing LED’s.

This is due to the following reasons:

- Declining prices
- Ability to display numbers, characters and graphics.
- Incorporation of a refreshing controller into the LCD.
- Ease of programming



- The user may select whether the

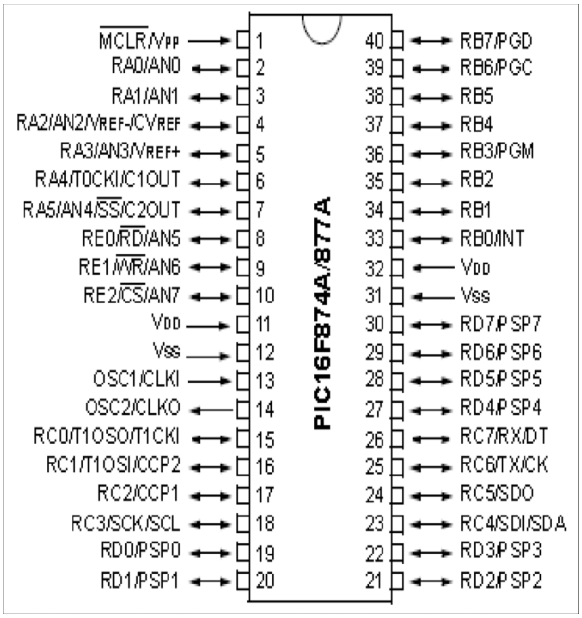
- LCD is to operate with a 4-bit data bus or an 8-bit data bus. If a 4-bit data bus is used the LCD
- will require a total of 7 data lines (3 control lines plus the 4 lines for the data bus). If an 8-bit
- data bus is used the LCD will require a total of 11 data lines (3 control lines plus the 8 lines for the data bus).

Important Signals:

- Enable (EN)
- Register Select (RS)
- Read/Write (R/W)

PIC Microcontroller:

- PIC microcontrollers are a family of specialized microcontroller chips produced by Microchip
- Technology in Chandler, Arizona. The acronym PIC stands for "peripheral interface controller,"
- although that term is rarely used nowadays. A microcontroller is a compact
- microcomputer designed to govern the operation of embedded systems in motor vehicles,robots,
- office machines, medical devices, mobile radios, vending machines, home appliances, and various other devices.
- PIC microcontroller has a set of registers that also function as RAM (random access
- memory). Special purpose control registers for on-chip hardware resources are also mapped into the data space.


PIC16F874A/877A
MCLR/VPP 1
RA0/AN0 2
RA1/AN1 3
RA2/AN2/VREF-/CVREF 4
RA3/AN3/VREF+ 5
RA4/T0CKI/C1OUT 6
RA5/AN4/SS/C2OUT 7
RE0/RD/AN5 8
RE1/WR/AN6 9
RE2/CS/AN7 10
VDD 11
Vss 12
OSC1/CLKI 13
OSC2/CLKO 14
RC0/T1OSO/T1CKI 15
RC1/T1OSI/CCP2 16
RC2/CCP1 17
RC3/SCK/SCL 18
RD0/PSP0 19
RD1/PSP1 20
40 RB7/PGD
39 RB6/PGC
38 RB5
37 RB4
36 RB3/PGM
35 RB2
34 RB1
33 RB0/INT
32 VDD
31 Vss
30 RD7/PSP7
29 RD6/PSP6
28 RD5/PSP5
27 RD4/PSP4
26 RC7/RX/DT
25 RC6/TX/CK
24 RC5/SDO
23 RC4/SDI/SDA
22 RD3/PSP3
21 RD2/PSP2

PROGRAM :