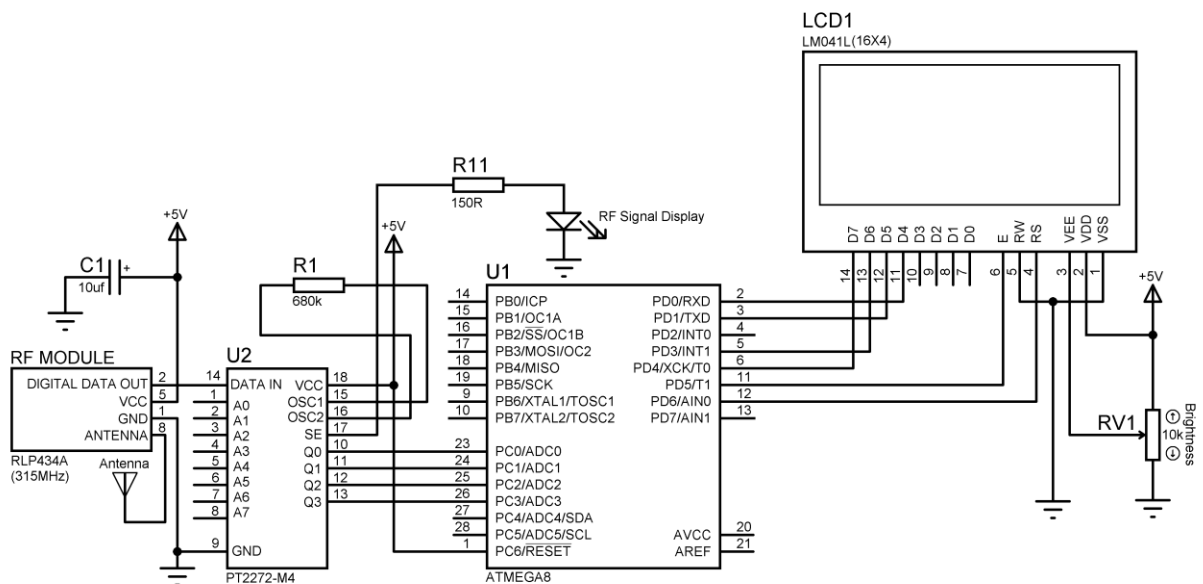


پروژه ارسال SMS با میکرو و مازول RF

تشریح عملکرد قسمت گیرنده مدار :

در ابتدا عبارت **RF REMOTE RECIVER** بر روی نمایشگر نوشته می شود سپس ورودی چک می شود و به محض اینکه دیتای ورودی 12 شد اجرای برنامه به برچسب **RECIVE** منتقل میشود , تا وقتی ورودی برابر 0 نشده اجرای برنامه در این قسمت متوقف می شود پس از 0 شدن ورودی 200 میلی ثانیه تاخیر ایجاد میشود سپس دیتای ورودی در متغیر **RECIVE-DATA** قرار داده می شود.

شماتیک مدار گیرنده :



برنامه اصلی مدار به زبان BASIC :

```
$regfile = "M8DEF.DAT"
$crystal = 8000000
Config Lcd = 16 * 4
Config Lcdpin = Pin , Db4 = Pind.0 , Db5 = Pind.1 , Db6 = Pind.3 , Db7 = Pind.4 , _
    E = Pind.5 , Rs = Pind.6
Dim Lcd_data As String * 1 , X As Byte , Y As Byte , Rs As Byte
Dim Cls_lcd As Bit , Recive_data As Byte , R1 As Byte , R2 As Byte , R As Byte
Config Pinc.0 = Input
Config Pinc.1 = Input
Config Pinc.2 = Input
Config Pinc.3 = Input
Declare Sub Wireless_recive
Declare Sub Message_code
Declare Sub Synchronous_program
```

```
'-----  
Y = 1 : X = 1  
Cls : Home : Cursor Off  
Lcd "RF MESSAGE"  
Locate 2 , 1 : Lcd "RECIVER"  
'-----  
  
Do  
Call Wireless_recive  
Waitms 50  
Decr Recive_data  
If Recive_data = 12 Then  
Cls : Home  
Goto Recive  
End If  
Loop  
'START OF RECIVE MESSAGE-----  
Recive:  
Do  
Call Wireless_recive  
If Recive_data = 0 Then Goto Level1  
Loop  
Level1:  
Waitms 200  
Call Wireless_recive  
Decr Recive_data  
R1 = Recive_data  
Rs = R1 : Call Synchronous_program  
Do  
Call Wireless_recive  
If Recive_data = 0 Then Goto Level2  
Loop  
'-----  
Level2:  
Waitms 200  
Call Wireless_recive  
Decr Recive_data  
R2 = Recive_data  
Rs = R2 : Call Synchronous_program  
Do  
Call Wireless_recive  
If Recive_data = 0 Then Goto Level3  
Loop  
'-----  
Level3:  
R2 = R2 * 10  
R = R1 + R2  
Call Message_code  
'-----  
If Cls_lcd = 1 Then  
Cls : Cls_lcd = 0  
Y = 1 : X = 1  
End If  
'-----  
Locate Y , X  
'-----  
If Lcd_data = "$" Then  
Incr Y : X = 1
```

```
Goto Recive
End If
'-----

Lcd Lcd_data
'-----

Incr X
If X > 15 Then
If Y = 4 Then
Y = 4 : X = 15
Else
X = 1 : Incr Y
End If : End If
'-----

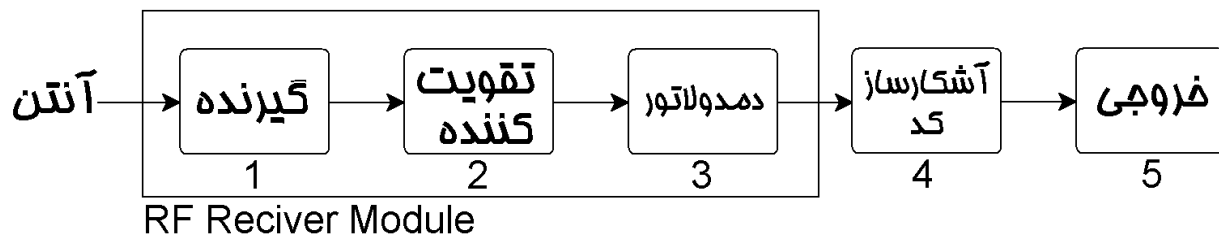
Goto Recive
'END OF RECIVE MESSAGE-----
'START OF WIRELESS_RECIVE SUB-----
Sub Wireless_recive:
Recive_data = &B00001111
If Pinc.0 = 0 Then Recive_data = Recive_data And &B00001110
If Pinc.1 = 0 Then Recive_data = Recive_data And &B00001101
If Pinc.2 = 0 Then Recive_data = Recive_data And &B00001011
If Pinc.3 = 0 Then Recive_data = Recive_data And &B00000111
End Sub Wireless_recive
Return
'END OF WIRELESS_RECIVE SUB-----
'START OF MESSAGE_CODE SUB-----
Sub Message_code:
Select Case R:
Case Is = 0 : Lcd_data = "0"
Case Is = 1 : Lcd_data = "1"
Case Is = 2 : Lcd_data = "2"
Case Is = 3 : Lcd_data = "3"
Case Is = 4 : Lcd_data = "4"
Case Is = 5 : Lcd_data = "5"
Case Is = 6 : Lcd_data = "6"
Case Is = 7 : Lcd_data = "7"
Case Is = 8 : Lcd_data = "8"
Case Is = 9 : Lcd_data = "9"
Case Is = 10 : Lcd_data = "A"
Case Is = 11 : Lcd_data = "B"
Case Is = 12 : Lcd_data = "C"
Case Is = 13 : Lcd_data = "D"
Case Is = 14 : Lcd_data = "E"
Case Is = 15 : Lcd_data = "F"
Case Is = 16 : Lcd_data = "G"
Case Is = 17 : Lcd_data = "H"
Case Is = 18 : Lcd_data = "I"
Case Is = 19 : Lcd_data = "J"
Case Is = 20 : Lcd_data = "K"
Case Is = 21 : Lcd_data = "L"
Case Is = 22 : Lcd_data = "M"
Case Is = 23 : Lcd_data = "N"
Case Is = 24 : Lcd_data = "O"
Case Is = 25 : Lcd_data = "P"
Case Is = 26 : Lcd_data = "Q"
Case Is = 27 : Lcd_data = "R"
Case Is = 28 : Lcd_data = "S"
```

```

Case Is = 29 : Lcd_data = "T"
Case Is = 30 : Lcd_data = "U"
Case Is = 31 : Lcd_data = "V"
Case Is = 32 : Lcd_data = "W"
Case Is = 33 : Lcd_data = "X"
Case Is = 34 : Lcd_data = "Y"
Case Is = 35 : Lcd_data = "Z"
Case Is = 36 : Lcd_data = "$"
Case Is = 37 : Lcd_data = "."
Case Is = 38 : Lcd_data = " "
End Select
Return
End Sub Message_code
'END OF MESSAGE_CODE SUB-----
'START OF Synchronous_program SUB-----
Sub Synchronous_program:
If Rs = 12 Then
Cls_lcd = 1
Do
Call Wireless_recive
If Recive_data = 0 Then Goto S1
Loop
S1:
Do
Call Wireless_recive
Waitms 50
Decr Recive_data
If Recive_data = 12 Then
Cls : Home
Goto Recive
End If
Loop
End If
Return
End Sub Synchronous_program
'END OF Synchronous_program SUB-----

```

بلوک یک مدار گیرنده :



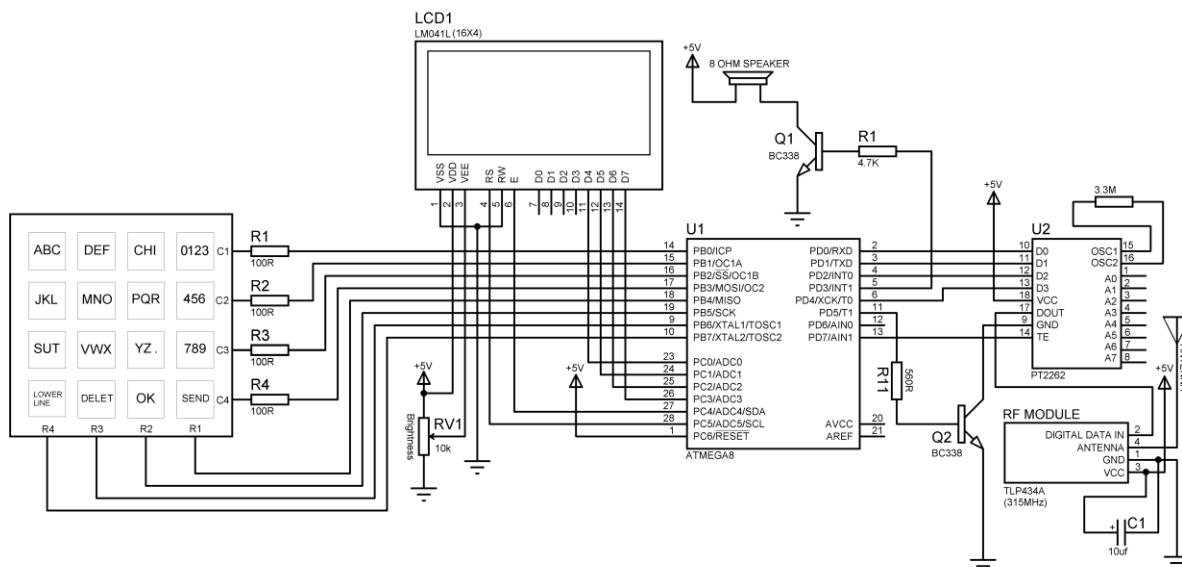
تشریح عملکرد قسمت فرستنده مدار :

برای هر کدام از کلید های مدار یک شمارنده در نظر گرفته شده که پس از هر بار فشار کلید یک واحد به شمارنده اضافه میشود به عنوان مثال کلید CBA اگر بیش از 3 بار فشار دهیم شمارنده RESET میشود و مقدار آن 0 است و با توجه به مقدار شمارنده رشته یا حرف مربوطه در متغیر LCD-DATA قرار می گیرد و رشته مربوط پس از قرار گرفتن در متغیر LCD-DATA بر روی LCD نمایش داده میشود .

جدول کد های ارسالی توسط : KEYPAD

کد ارسالی	کاراکتر	کد ارسالی	کاراکتر	کد ارسالی	کاراکتر	کد ارسالی	کاراکتر	کد ارسالی	کاراکتر
1	1	31	V	24	O	17	H	10	A
2	2	32	W	25	P	18	I	11	B
3	3	33	X	26	Q	19	J	12	C
4	4	34	Y	27	R	20	K	13	D
5	5	35	Z	28	S	21	L	14	E
6	6	36	\$	29	T	22	M	15	F
7	7	0	0	30	U	23	N	16	G
		37	فاصله	0	0	9	9	8	8

شماتیک فرستنده مدار :



برنامه اصلی مدار به زبان BASIC :

```
$regfile = "M8DEF.DAT"
$crystal = 8000000
Config Kbd = Portb , Debounce = 50 , Delay = 100
Config Lcd = 16 * 4
Config Lcdpin = Pin , Db4 = Pinc.0 , Db5 = Pinc.1 , Db6 = Pinc.2 , Db7 = Pinc.3_
, E = Pinc.4 , Rs = Pinc.5
Dim Lcd_data As String * 1 , X As Byte , Y As Byte , Recive_data As Byte
Dim C1 As Byte , C2 As Byte , C3 As Byte , C4 As Byte , Code As String * 1
Dim C5 As Byte , C6 As Byte , C7 As Byte , C8 As Byte , S1 As String * 1
Dim C9 As Byte , C10 As Byte , C11 As Byte , C0 As Byte
Dim S(81) As String * 1 , Count As Byte , Send As Byte , S2 As String * 1
Dim X1_save As Byte , X2_save As Byte , X3_save As Byte , Send_data As Byte
Dim Synchronous_data As Byte , String_of_send_data As String * 2 , H As Byte
Config Portd = Output
Declare Sub Wireless_send
Declare Sub Message_code
Pt_power Alias Portd.5 : Pt_enable Alias Portd.7
'-----
Cursor Off
Cls : Home
Lcd "PLEASE ENTER"
Locate 2 , 1
Lcd "YOUR MESSAGE"
Wait 1
Cls : Cursor On : Y = 1 : X = 1
'START OF WRITEING MESSAGE PROGRAM-----
H1:
Recive_data = Getkbd()
If Recive_data = 16 Then Goto H1
Select Case Recive_data:
'-----
Case Is = 0
Incr C0
If C0 = 1 Then Lcd_data = "0"
If C0 = 2 Then Lcd_data = "1"
If C0 = 3 Then Lcd_data = "2"
If C0 = 4 Then
C0 = 0 : Lcd_data = "3"
End If
'-----
Case Is = 4
Incr C4
If C4 = 1 Then Lcd_data = "4"
If C4 = 2 Then Lcd_data = "5"
```

If C4 = 3 Then

C4 = 0 : Lcd_data = "6"

End If

'-----

Case Is = 8

Incr C8

If C8 = 1 Then Lcd_data = "7"

If C8 = 2 Then Lcd_data = "8"

If C8 = 3 Then

C8 = 0 : Lcd_data = "9"

End If

'-----

Case Is = 3

Incr C3

If C3 = 1 Then Lcd_data = "A"

If C3 = 2 Then Lcd_data = "B"

If C3 = 3 Then

C3 = 0 : Lcd_data = "C"

End If

'-----

Case Is = 2

Incr C2

If C2 = 1 Then Lcd_data = "D"

If C2 = 2 Then Lcd_data = "E"

If C2 = 3 Then

C2 = 0 : Lcd_data = "F"

End If

'-----

Case Is = 1

Incr C1

If C1 = 1 Then Lcd_data = "G"

If C1 = 2 Then Lcd_data = "H"

If C1 = 3 Then

C1 = 0 : Lcd_data = "I"

End If

'-----

Case Is = 7

Incr C7

If C7 = 1 Then Lcd_data = "G"

If C7 = 2 Then Lcd_data = "H"

If C7 = 3 Then

C7 = 0 : Lcd_data = "I"

End If

'-----

Case Is = 6

Incr C6

If C6 = 1 Then Lcd_data = "M"

If C6 = 2 Then Lcd_data = "N"

If C6 = 3 Then

C6 = 0 : Lcd_data = "O"

End If

'-----

Case Is = 5

Incr C5

If C5 = 1 Then Lcd_data = "P"

If C5 = 2 Then Lcd_data = "Q"

If C5 = 3 Then

C5 = 0 : Lcd_data = "R"

End If

'-----

Case Is = 11

Incr C11

If C11 = 1 Then Lcd_data = "S"

If C11 = 2 Then Lcd_data = "T"

If C11 = 3 Then

C11 = 0 : Lcd_data = "U"

End If

'-----

Case Is = 10

Incr C10

If C10 = 1 Then Lcd_data = "V"

If C10 = 2 Then Lcd_data = "W"

If C10 = 3 Then

C10 = 0 : Lcd_data = "X"

End If

'-----

Case Is = 9

Incr C9

If C9 = 1 Then Lcd_data = "Y"

If C9 = 2 Then Lcd_data = "Z"

If C9 = 3 Then

C9 = 0 : Lcd_data = "."

End If

'START OF LOWERLINE BUTTON PROGRAM-----

Case Is = 15

If S(count) <> Lcd_data Then Lcd_data = " "

Locate Y , X

Lcd Lcd_data

'-----

Incr Count

S(count) = "\$"

If Y = 4 Then Goto H2


```
Lcd_data = " "  
If Y = 1 Then X1_save = X  
If Y = 2 Then X2_save = X  
If Y = 3 Then X3_save = X  
Incr Y : X = 1  
H2:  
'END OF LOWERLINE BUTTON PROGRAM-----  
'START OF DELETE BUTTON PROGRAM-----  
Case Is = 14  
S(count) = " "  
If Count > 0 Then Decr Count  
Decr X  
'-----  
If Y = 1 Then  
If X = 0 Then X = 1  
End If  
'-----  
If Y > 1 Then  
If X = 0 Then  
If Y = 4 Then X = X3_save  
If Y = 3 Then X = X2_save  
If Y = 2 Then X = X1_save  
Decr Y  
End If : End If  
'-----  
Lcd_data = " "  
Locate Y , X  
Lcd Lcd_data  
'END OF DELETE BUTTON PROGRAM-----  
'START OF OK BUTTON PROGRAM-----  
Case Is = 13  
Incr Count  
S(count) = Lcd_data  
Lcd_data = " "  
'-----  
Incr X  
If X > 15 Then  
If Y = 1 Then X1_save = 15  
If Y = 2 Then X2_save = 15  
If Y = 3 Then X3_save = 15  
If Y < 4 Then  
X = 1 : Incr Y  
Else  
X = 15  
End If : End If  
'END OF OK BUTTON PROGRAM-----
```

'START OF SEND BUTTON PROGRAM-----

Case Is = 12

Sending:

'-----

Synchronous_data = 12

Send_data = Synchronous_data

Call Wireless_send

'-----

For Send = 1 To Count Step 1

Code = S(send)

Call Message_code

String_of_send_data = Str(send_data)

H = Len(string_of_send_data)

If H = 1 Then

Send_data = Val(string_of_send_data)

Call Wireless_send

Send_data = 0

Call Wireless_send

End If

If H = 2 Then

S1 = Mid(string_of_send_data , 2 , 1)

Send_data = Val(s1)

Call Wireless_send

S2 = Mid(string_of_send_data , 1 , 1)

Send_data = Val(s2)

Call Wireless_send

End If

Next Send

'-----

Synchronous_data = 12

Send_data = Synchronous_data

Call Wireless_send

'END OF SEND BUTTON PROGRAM-----

End Select

'-----

Locate Y , X

Lcd Lcd_data

Sound Portd.3 , 100 , 80

'-----

H3:

Recive_data = Getkbd()

If Recive_data <> 16 Then Goto H3

'-----

Goto H1

'END OF WRITEING MESSAGE PROGRAM-----

'START OF WIRELESS_SEND SUB-----

Sub Wireless_send:

Reset Pt_power : Set Pt_enable

Incr Send_data

Select Case Send_data:

Case Is = 1

Set Portd.0 : Reset Portd.1 : Reset Portd.2 : Reset Portd.4

'-----

Case Is = 2

Reset Portd.0 : Set Portd.1 : Reset Portd.2 : Reset Portd.4

'-----

Case Is = 3

Set Portd.0 : Set Portd.1 : Reset Portd.2 : Reset Portd.4

'-----

Case Is = 4

Reset Portd.0 : Reset Portd.1 : Set Portd.2 : Reset Portd.4

'-----

Case Is = 5

Set Portd.0 : Reset Portd.1 : Set Portd.2 : Reset Portd.4

'-----

Case Is = 6

Reset Portd.0 : Set Portd.1 : Set Portd.2 : Reset Portd.4

'-----

Case Is = 7

Set Portd.0 : Set Portd.1 : Set Portd.2 : Reset Portd.4

'-----

Case Is = 8

Reset Portd.0 : Reset Portd.1 : Reset Portd.2 : Set Portd.4

'-----

Case Is = 9

Set Portd.0 : Reset Portd.1 : Reset Portd.2 : Set Portd.4

'-----

Case Is = 10

Reset Portd.0 : Set Portd.1 : Reset Portd.2 : Set Portd.4

'-----

Case Is = 11

Set Portd.0 : Set Portd.1 : Reset Portd.2 : Set Portd.4

'-----

Case Is = 12

Reset Portd.0 : Reset Portd.1 : Set Portd.2 : Set Portd.4

'-----

Case Is = 13

Set Portd.0 : Reset Portd.1 : Set Portd.2 : Set Portd.4

'-----

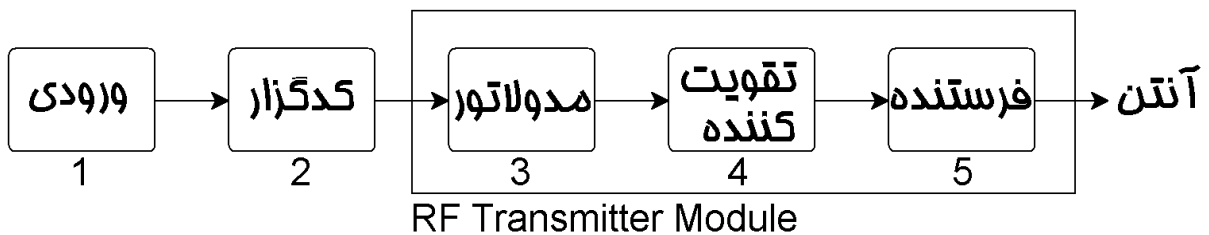
```
End Select
Waitms 50
Set Pt_power
Reset Pt_enable
Waitms 400
Reset Pt_power
Set Pt_enable
Waitms 100
Return
End Sub Wireless_send
'END OF WIRELESS_SEND SUB-----
'START OF MESSAGE_CODE SUB-----
Sub Message_code:
Select Case Code:
Case Is = "0" : Send_data = 0
Case Is = "1" : Send_data = 1
Case Is = "2" : Send_data = 2
Case Is = "3" : Send_data = 3
Case Is = "4" : Send_data = 4
Case Is = "5" : Send_data = 5
Case Is = "6" : Send_data = 6
Case Is = "7" : Send_data = 7
Case Is = "8" : Send_data = 8
Case Is = "9" : Send_data = 9
Case Is = "A" : Send_data = 10
Case Is = "B" : Send_data = 11
Case Is = "C" : Send_data = 12
Case Is = "D" : Send_data = 13
Case Is = "E" : Send_data = 14
Case Is = "F" : Send_data = 15
Case Is = "G" : Send_data = 16
Case Is = "H" : Send_data = 17
Case Is = "I" : Send_data = 18
Case Is = "J" : Send_data = 19
Case Is = "K" : Send_data = 20
Case Is = "L" : Send_data = 21
Case Is = "M" : Send_data = 22
Case Is = "N" : Send_data = 23
Case Is = "O" : Send_data = 24
Case Is = "P" : Send_data = 25
Case Is = "Q" : Send_data = 26
Case Is = "R" : Send_data = 27
Case Is = "S" : Send_data = 28
Case Is = "T" : Send_data = 29
Case Is = "U" : Send_data = 30
Case Is = "V" : Send_data = 31
```

```

Case Is = "W" : Send_data = 32
Case Is = "X" : Send_data = 33
Case Is = "Y" : Send_data = 34
Case Is = "Z" : Send_data = 35
Case Is = "$" : Send_data = 36
Case Is = "." : Send_data = 37
Case Is = " " : Send_data = 38
End Select
Return
End Sub Message_code
'END OF MESSAGE_CODE SUB-----

```

بلوک مدار فرستنده یا SENDER :

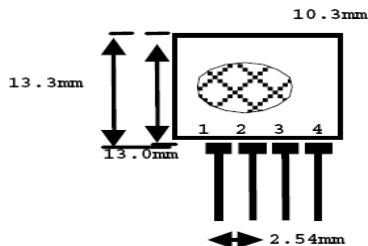


طرز کار مدار :

این مدار با میکرو کنترلر AVR ATMEGA 8 و LCD کاراکتری 16X4

و یک ماژول فرستنده و گیرنده RF به شماره TLP434 که در باند فرکانسی 315 zHM کار میکند ساخته شده است بلوک دیاگرام ماژول به شکل زیر است :

TLP434A Ultra Small Transmitter



pin 1 : GND
pin 2 : Data In
pin 3 : Vcc
pin 4 : Antenna (RF output)

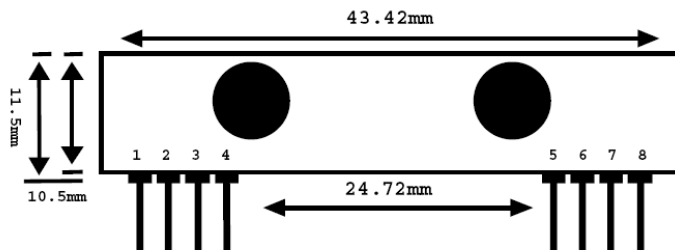
Frequency 315, 418 and 433.92 Mhz

Modulation : ASK

Operation Voltage : 2 - 12 VDC

ایم ماژول ها هم به صورت تک و هم با IC دکودر در بازار موجود است :

RLP434A SAW Based Receiver



pin 1 : Gnd
pin 2 : Digital Data Output
pin 3 : Linear Output /Test
pin 4 : Vcc
pin 5 : Vcc
pin 6 : Gnd
pin 7 : Gnd
pin 8 : Antenna

Frequency 315, 418 and 433.92 Mhz

Modulation : ASK

Supply Voltage : 3.3 - 6.0 VDC

Output : Digital & Linear

طریقه ارسال SMS :

بعد از کد گذاری هر دو IC دکودر مدار که باید هر دو کد یکسان باشند شروع به تایپ SMS میکنیم
برای اصلاح نوشته از کلید DELETE و سپس OK و برای ارسال از کلید SEND استفاده میکنیم .

برد مدار به عوامل گوناگون بستگی دارد اما با استفاده از همین ماژول و در فضای باز برد 3 الی 4
کیلومتر را می توان انتظار داشت.