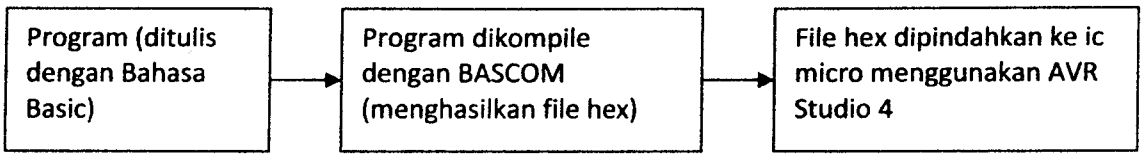
LAMPIRAN

Program Transmit dan Receive modul RFM12. Program ditulis dengan bahasa Basic dan compiler BASCOM dari MCS Electronic,serta menggunakan AVR Studio 4 dari ATMEL untuk memindahkan file program ke ic microcontroller ATMEGA8




```
$regfile = "m8def.dat"
$hwstack = 32
$swstack = 10
$framesize = 40
$crystal = 8000000
$baud = 19200

Const File = "TxRx 1.05 .bas"
Const Description = "RFM12 monitor program"

Print
Print Description
Print File
Print Version()

Rfm12_rst Alias Portc.5
Config Rfm12_rst = Input

Config Portb = &B0010_1101

Test_pin Alias Portb.0

Rfm12_cs Alias Portb.2
Set Rfm12_cs

Rfm12_sdi Alias Portb.3

Rfm12_sdo Alias Pinb.4
Set Portb.4

Rfm12_sck Alias Portb.5

Rx_led Alias Portd.5
Config Pind.5 = Output

Tx_led Alias Portd.6
```

```
Config Pind.6 = Output

Error_led Alias Portd.7
Config Pind.7 = Output

Config Spi = Hard , Interrupt = Off , Data Order = Msb , Master = Yes , _
Polarity = Low , Phase = 0 , Clockrate = 4 , Noss = 1

Spiinit

Declare Sub Rfm12_spi_wrt
Declare Sub Rfm12_tx(txarray As Byte)
Declare Sub Rfm12_rx(rxarray As Byte)
Declare Sub Rfm12_tx_ready
Declare Sub Rfm12_rx_wait
Declare Sub Rfm12_get_status_bit
Declare Sub Saveflags
Declare Sub Rfm12_clear_fifo
Declare Sub Rfm12_rx_on
Declare Sub Rfm12_init
Declare Sub Printflags

Min Freq 430.24
'Max Freq 439.75
'in 2.5KHz steps
'
'Fc = the center Freq. in MHz
'Fr = the Freq. register value.
'Fc = 430 + Fr * 0.0025 (MHz)
'Fr = (Fc - 430) * 400
Const Fc = 435.00
Const Fr =(fc - 430) * 400
Const Fcmnd = &HA000 + Fr

'const Payload_Size = 128
Const Payload_size = 32
'const Payload_Size = 16
Const Pls_plus1 = Payload_size + 1

Const Beacon = "12345678901234567890123456789O"

Dim Tempbit As Bit
Dim Temp As Byte
Dim Tempw As Word

Dim Spi_tx_wrd As Word
Dim Spi_tx_l As Byte At Spi_tx_wrd Overlay
Dim Spi_tx_h As Byte At Spi_tx_wrd + 1 Overlay
Dim Spi_rx_wrd As Word
Dim Spi_rx_l As Byte At Spi_rx_wrd Overlay
```

```
Dim Spi_rx_h As Byte At Spi_rx_wrd + 1 Overlay

Dim Rx_status_bit As Bit
Dim Rxbuffer(pls_plus1) As Byte
Dim Rxstring As String * Payload_size At Rxbuffer(1) Overlay
Rxbuffer(pls_plus1) = 0

Dim Txindex As Byte
Dim Txbuffer(pls_plus1) As Byte
Dim Txstring As String * Payload_size At Txbuffer(1) Overlay
Txbuffer(pls_plus1) = 0

Dim Timeout As Word
Dim Cmnd As String * 4
Dim Flags As Byte

Echoflag Alias Flags.0
Beaconflag Alias Flags.1
Sermsgflag Alias Flags.2
Rxonflag Alias Flags.3
Txonflag Alias Flags.4

Dim Dummy As Eram Word At 0
Dim Progcntr As Eram Word At 2
Dim Savedflags As Eram Byte


Tempw = Progcntr
Print "uC flashed " ; Tempw ; " times."
Print

'kill some time here while
'rfm12 does a power on reset.
Reset Rx_led
Reset Tx_led
Reset Error_led
Waitms 500
Set Rx_led
Set Tx_led
Set Error_led

Rfm12_init
Rfm12_rx_on

Flags = Savedflags
Print "Echo = " ; Echoflag
Print "Beacon = " ; Beaconflag
Cmnd = ""

Do
```

```
If Beaconflag = 1 Then
  'Tx a test beacon about once a second.
  Txstring = Beacon
  Print "Tx: " ; Txstring
  Rfm12_tx Txbuffer(1)
  'now loop waiting for a reply msg.
  For Temp = 1 To 255
    'poll RFM12 for Rx data.
    Rfm12_get_status_bit
    If Rx_status_bit = 1 Then
      'Rx RxBuffer
      Rfm12_rx Rxbuffer(1)
      Print "Rx: " ; Rxstring
      If Rxstring <> Txstring Then
        Reset Error_led
        Print "<>"
      End If
      Rxstring = ""
      Exit For
    End If
    If Temp = 255 Then
      Reset Error_led
      Print "no echo"
    End If

    'waitus 50       'at 38.3kbps, 32 byte payload
    'waitus 350      'at 19.2kbps, 128 bytes
    Waitus 150                          'at 19.2kbps, 32 bytes
    Set Error_led
  Next Temp
Else
  'poll RFM12 for Rx data.
  Rfm12_get_status_bit
  If Rx_status_bit = 1 Then
    'reset RX_LED
    'Rx RxBuffer
    Rfm12_rx Rxbuffer(1)
    Print "Rx: " ; Rxstring
    If Echoflag = 1 Then
      Print "Ec: " ; Rxstring
      'Tx RxBuffer.
      Rfm12_tx Rxbuffer(1)
    End If
    'set RX_LED
  End If
End If

Temp = Inkey()
If Temp <> 0 Then
```

```
    If Temp = 27 Then
      'press "esc" to get a command prompt.
      Spi_tx_wrd = 0
      Rfm12_spi_wrt
      Print
      Print Description
      Print File
      Print Version()
      Print
      Tempw = Progcntr
      Print "uC flashed " ; Tempw ; " times."
      'print
      'print "Status word = " ; bin(SPI_Rx_H) ; "_" ; bin(SPI_Rx_L)
      Printflags
      Print
      Input "Command >", Cmnd
      Print
      Rfm12_rx_on
    Elseif Temp = 13 Then
      Print
      Print "Tx: " ; Txstring
      'Tx TxBuffer.
      Rfm12_tx Txbuffer(1)
      Txstring = ""
      Txindex = 0
    Else
      'fill the TxBuffer until <cr> or full.
      If Txindex < Payload_size Then
        Print Chr(temp);
        Incr Txindex
        Txbuffer(txindex) = Temp
        Temp = Txindex + 1
        Txbuffer(temp) = 0
      End If
    End If
  End If


  If Cmnd <> "" Then
    Select Case Cmnd
      Case "u"
            'Press "u <CR>"
           Print
       Print "Press F4 to start upload."
        Waitms 3000

        Goto &HC00

      Case "c"
```

```
        Print
        Input "Enter a Command Word in HEX >", Cmnd
        Spi_tx_wrd = Hexval(cmnd)
        Rfm12_spi_wrt
        Print "RFM12 returned >"; Hex(spi_rx_wrd)

      Case "b"
        Toggle Beaconflag
        If Beaconflag = 1 Then Echoflag = 0
        Saveflags
        Printflags

      Case "e"
        Toggle Echoflag
        If Echoflag = 1 Then Beaconflag = 0
        Saveflags
        Printflags

      Case Else
        Print "Unknown Command"

    End Select
    Print
    Cmnd = ""
  End If
Loop

Sub Printflags
  If Beaconflag = 1 Then
    Print "Beacon ON"
  Else
    Print "Beacon OFF"
  End If
  If Echoflag = 1 Then
    Print "Echo ON"
  Else
    Print "Echo OFF"
  End If
End Sub

Sub Saveflags
  'save to eram
  Flags = Flags And 3
  Savedflags = Flags
End Sub

Sub Rfm12_init
  Local I As Byte
  Print "Init values:"
  'Initialize RFM12
```

```
  Restore Init_data
  For I = 1 To 14
    Read Spi_tx_wrd
    Print Hex(spi_tx_wrd)
    'send init data to RFM12.
    Rfm12_spi_wrt
    'waitms 100
  Next I
  Print
End Sub
```