

\$prog &HFF , &HCE , &HD9 , &H00 ' generated. Take
care that the chip supports all fuse bytes.

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' *****  
' *  
' * Decodierung des SML-Codes vom Stromzähler Easymeter M60 über den *  
' * RXD-Input am Atmega 8 und Anzeige der Daten mit einem LCD-Display *  
' * oder über die RS 232-Schnittstelle. *  
' * *  
' *****
```

\$regfile = "M8aDEF.dat"
\$crystal = 3686400 '3,6864 MHz
\$baud = 9600 'Baudrate

\$hwstack = 40
\$swstack = 40
\$framesize = 30

Ddrc = &B00111100 'Pin C.2 bis C.5 =
Out
Portc = &B11000011 'Port C Pullup ein
Ddrb = &B00000111 'Pin B.0 + B1 + B2
= Out
Portb = &B11111000 'Port B Pullup ein
Ddrd = &B10100000 'Pin D.5 + D.7 = Out
Portd = &B01011111 'Port D alle Pullup
ein

Declare Sub Lsteaus
Declare Sub Hconv
Declare Sub Lcdprint

Dim M As String * 8
Dim W As Long 'decode Databytes

Dim G As Byte
Dim H As Byte
Dim K As Byte '4 Databytes from
SML-Telegram
Dim L As Byte

Dim Lt As Word 'Countdown for
Lampstest
Dim N As Word 'tbd
Dim B As Byte
Dim C As Bit
Dim Del As Word
Dim S As Byte 'Delay-Time in sec.

Dim Bool As Byte 'to make AND-
Funktion
Dim Day As Dword 'Countdown 1Day in
sec.

Dim A1 As Dword
Dim A1old As Dword 'to get positive
Power for 1Day
Dim A1d As Dword

```

Dim A2 As Dword
Dim A2old As Dword                                     'to get negative
Power for 1Day
Dim A2d As Dword

Dim Pg As Long
Dim P1 As Long
Dim P2 As Long                                       'Power and Volt-
Variables
Dim P3 As Long
Dim U1 As Word
Dim U2 As Word
Dim U3 As Word

Dim D(400) As Byte                                    'SML-Store

Del = 128
Day = 20                                             'get started
Lt = 15

'-----
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Config Lcdpin = Pin , Db4 = Portc.5 , Db5 = Portc.4 , Db6 = Portc.3 , Db7 =
Portc.2 , E = Portb.2 , Rs = Portb.1
Config Lcd = 16 * 2
Cursor Off Noblink

Deflcdchar 1 , 31 , 31 , 31 , 31 , 31 , 31 , 31 , 31   'Lamptest

Cls

'-----
-

On Urxc Onrxd                                       'Interrupt-Flag
Enable Urxc

Do

Do

If Ucsra.rxc = 1 Then                               'one Byte in USART
(UDR)

    B = Udr

    Select Case B                                    'test of
Startsequenz

        Case 27
            Incr N

        Case 27
            Incr N

        Case 27                                       'look for
            Incr N                                     'Startsequenz:

        Case 1
            Incr N                                       '1B,1B,1B,01,01,01

        Case 1
            Incr N

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Case 1
Incr N

Case Else
N = 0

End Select

End If

Loop Until N = 6                                'get it!

N = 0

Enable Interrupts                               'Interrupt enabled

Do
Loop Until N = 400                              ' read 400 Bytes in
SML-Store

Disable Interrupts                             'no more Interrupts

'-----

If Pind.6 = 0 Then                              'if Button then:
    Gosub Listeaus                              ' Dataset to
Terminal
End If

'----- Data processing -----

'----- Energie: A1,A2 (kWh) -----

G = D(169)
H = D(170)
K = D(171)
L = D(172)

Gosub Hconv                                    'Hex to Dez

W = W / 1000
W = W * 256                                  '* 0.0000256
W = W / 10000
A1 = W

Print ; " A1          " ; A1 ; "      KWh      (Bezug)" 'positive (used)

G = D(197)
H = D(198)
K = D(199)
L = D(200)

Gosub Hconv

W = W / 1000
W = W * 256
W = W / 10000
A2 = W

Print ; " A2          " ; A2 ; "      KWh      (Lieferung)" 'negative (send
back)

```

```

Print
'----- Leistung Pg (Watt) -----

G = D(222)
H = D(223)
K = D(224)
L = D(225)

Gosub Hconv

Pg = W / 100                                     '* 0.01

Print ; " Pg          " ; Pg ; "          Watt"

Bool = D(218) And &H80                          'Test of Polarity

If Bool = 0 Then                                  'positive Result

    If Del > 4 Then
        Decr Del
    If Del = 4 Then                                'Relay "OFF" after
Delay (296s max)
        Portb.0 = 0
        Portd.7 = 1
    End If
    End If

Else                                              'negative Result

    Incr Del
    Portd.7 = 0

    If Del > 256 Then
        Del = 300
        Portb.0 = 1                                'Relay "ON" after
Delay (252s max)
    End If

End If

Print

'----- P1 -----

G = D(246)
H = D(247)
K = D(248)
L = D(249)

Gosub Hconv

P1 = W / 100                                     '* 0.01

Print ; " P1          " ; P1 ; "          Watt"

'----- P2 -----

G = D(270)
H = D(271)
K = D(272)
L = D(273)

Gosub Hconv

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P2 = W / 100                                     '* 0.01
Print ; " P2          " ; P2 ; "      Watt"

'----- P3 -----

G = D(294)
H = D(295)
K = D(296)
L = D(297)

Gosub Hconv

P3 = W / 100                                     '* 0.01

Print ; " P3          " ; P3 ; "      Watt"
Print

'----- Spannungen (Volt~) -----

G = 0
H = 0
K = D(314)
L = D(315)

Gosub Hconv

U1 = W / 10                                     '* 0.1

Print ; " U1          " ; U1 ; "      Volt ~"

G = 0
H = 0
K = D(332)
L = D(333)

Gosub Hconv

U2 = W / 10                                     '* 0.1

Print ; " U2          " ; U2 ; "      Volt ~"

G = 0
H = 0
K = D(350)
L = D(351)

Gosub Hconv

U3 = W / 10                                     '* 0.1

Print ; " U3          " ; U3 ; "      Volt ~"
Print
Print ; " Day      A1d      A2d      Del      Bool "
Print ; " " ; Day ; "      " ; A1d ; "      " ; A2d ; "      " ; Del ; "      " ; Bool
Print ;
Print ; " -----"

Gosub Lcdprint

Loop

```

End

'----- SUB Hconv -----

Hconv:

M = Hex(g) + Hex(h) + Hex(k) + Hex(l)

W = Hexval(m) '4 Byte to dezimal

Return

'----- SUB Listeaus -----

Listeaus:

For N = 1 To 400

Print N ; " " ; D(n) 'Dataset to Terminal

Next N

Print

Return

'----- SUB Lcdprint -----

Lcdprint:

If Portd.5 = 0 Then

Locate 1 , 1

Lcd " "

Locate 1 , 1

Lcd "A1: " ; A1

Locate 1 , 14

Lcd "kWh"

Else

Locate 1 , 1

Lcd " "

Locate 1 , 1

Lcd "A2: " ; A2

Locate 1 , 14

Lcd "kWh"

End If

Locate 2 , 1

Lcd " "

Locate 2 , 1

Lcd "P : " ; Pg

Locate 2 , 16

Lcd "W"

Toggle Portd.5 'Clock 1/s

Decr Day

Decr Lt

Incr S

If S > 30 Then

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    If S > 35 Then
        S = 0
        A1d/A2d
        End If
        'Time to view

        Locate 1 , 14
        Lcd "kWh"
        Locate 1 , 1
        Lcd "Eff: " ; A1d ; "/" ; A2d

    End If

    If Day = 0 Then
        Day = 86400
        'one Day passed

        A1d = A1 - A1old
        A1old = A1
        'Get Power for 1 Day

        A2d = A2 - A2old
        A2old = A2

    End If

    If Lt = 0 Then
        Lt = 8640

        For N = 1 To 16
            Locate 1 , N
            Lcd Chr(1);
            Locate 2 , N
            Lcd Chr(1);
            'LCD-Lamp-Test
        Next N

    End If

    Return

'----- ISR USART -----

Onrx:

D(n) = Udr
Incr N

Return

End

```