

IFD2343Code

```
;  
;Controller Maps Electric Drive Battery Voltage to Thermal Fuel Gage  
; William Grill  
; 16F506  
PC equ 2 ;  
STATUS equ 3 ;  
#define CARRY STATUS,0 ;  
#define ZERO STATUS,2 ;  
SFR equ 4  
Calib equ 5  
GPIOB equ 6  
GPIOC equ 7  
ADCTL equ 9 ;  
#define ADready ADCTL,1 ;  
ADDATA equ 0xA ;  
  
#define meterdrive GPIOC,0  
#define sensorenable GPIOC,1  
#define contact GPIOC,4  
#define syncin GPIOC,5  
;  
#define emptylite GPIOB,4  
;#define alarm optional GPIOB,5  
;  
#define fulloffset .25 ; 26/256*5  
;  
setEmpty equ 0x10 ; empty setting  
setFail equ 0x11 ; fail setting  
;display equ 0x12  
delayK equ 0x13  
cnt equ 0x15  
D equ 0x16  
M1 equ 0x17  
M2 equ 0x18  
RL equ 0x19  
Rh equ 0x1A  
Battin equ 0x1C ; battery in  
temp equ 0x1D  
M1H equ 0x1E  
; start here  
init  
; *****  
;  
;
```

```

movwf Calib
movlw 0xC0 ; 1100 0000
OPTION
;
movlw 0xF7 ; disable cmp0,1
movwf 8
movwf 0xB
;
clrf SFR
movlw 0x20
movwf 0xC
clrf GPIOB
clrf GPIOC
movlw 0xEF
TRIS GPIOB ; 1110 1111
movlw 0xE4 ; 1110 0100
TRIS GPIOC
movlw .145
movwf delayK
movlw .100
movwf Battin
movwf cnt
movwf D
movlw 0xE1 ; 11 10 00 01 *** set up fail value
movwf ADCTL
bsf ADCTL,1
init3:
btfsc ADready
goto init3
movfw ADDATA
movwf setFail
movlw 0xE5 ; 11 10 01 01 set up empty value
movwf ADCTL
bsf ADCTL,1
init4:
btfsc ADready
goto init4
movfw ADDATA
movwf setEmpty
bsf contact
init1:
btfsc syncin
goto init1
init2:
btfss syncin ; loop till rising edge
goto init2

```

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; *** EVALUATE LITE and PROCESS TO BE USED
movfw Battin
subwf setEmpty,w
btfsc CARRY
goto continue
movfw Battin
subwf setFail,w
btfsc CARRY
goto init6
bcf emptylite
bsf alarm ; possible service before disconnect
; shut down
bcf contact ; also available as an emptylite
die:
goto die
; *****
init6:
bsf emptylite ; assert emptylite
movlw 1
bsf meterdrive ; assert output within 5uS **** 0 ***
goto init7
continue: ; battery is in scope
bsf meterdrive ; assert output within 5uS **** 0 ***
nop
bcf emptylite ; turn off emptylite
nop
nop
nop
init7: ; *** delay using delayK
movfw delayK
movwf temp
init7a:
nop ; original copy of D
nop
decfsz temp
goto init7a
;
decfsz cnt
goto init7
;
bcf meterdrive
nop ; wait for transistor to switch and syncin to be readable
nop
nop
nop
nop

```



```

    movfw ADDATA
    movwf Battin
;
    movlw fulloffset
    subwf Battin,w
    btfsc CARRY
    goto init5a
    movlw fulloffset ; limit Battin
    movwf Battin
init5a:
    bcf sensorenable
;
scalerprocess:    ; multiple M1 * M2
    movfw Battin
    subwf setEmpty,w
    btfsc CARRY
    goto scale1
    movlw 1
scale1:
    movwf M2
    movlw 8
    movwf cnt
    clrf M1H
    clrf RL
    clrf Rh
mult1:
    bcf CARRY
    rrf M2
    btfss CARRY
    goto mult2
;
    movfw M1H
    addwf Rh
    movfw M1
    addwf RL
    btfsc CARRY
    incf Rh
    bcf CARRY
mult2:
    rlf M1
    rlf M1H
    decfsz cnt
    goto mult1
; done : result in RhRL
    movf RL
    btfss ZERO

```

```

goto Dividethis
movf Rh
btfsc ZERO
incf RL
; *****
Dividethis: ; RhRL/divisor
    clrf cnt
    movlw fulloffset ; fixed setting for full A/D value
    subwf setEmpty,w
Divide1:
    incf cnt
    subwf RL
    btfsc CARRY
    goto Divide1
    movf Rh
    btfsc ZERO
    goto Divide1a
    decf Rh
    goto Divide1
; done cnt has number of scaled delayloops to display
Divide1a:
    movfw cnt
    movwf D
    goto init2
; retlw 0
END

```