APPLICATION OPERATION

This application is a transmission sensor for a car with a remote starter. Because it is an automatic car remote starter, it is relatively cheap while one for a manual car can be very expensive. The principle behind the application is very simple. There are two infra-red LED emitting lights in-line with two phototransistors so that when the shifter is engaged, it must cut one of the two rays. There is an additional Hand Brake sensor for most cars having the same systems (a pin switch that touches the body when the hand brake is up). There is also a green LED connected to the microcontroller that, when all conditions are good (Shifter in middle, Hand Brake On), the LED blinks five times to show the driver that the car is ready for starting from the remote Starter.

BLOCK DIAGRAM

[Diagram of the transmission sensor for remote car starter]
Electromechanical Switch Replacement

GRAPHICAL HARDWARE REPRESENTATION

SENSOR.HPP = Schematic in HP Printer format
SENSOR.PCB = Board in PCAD format
SOLD1X.HPP = Solder side of PCB in HP Printer Format (1X)
COMP1X.HPP = Components side of PCB in HP Printer Format (1X)
SOLD2X.HPP = Solder side of PCB in HP Printer Format (2X)
COMP2X.HPP = Components side of PCB in HP Printer Format (2X)

MICROCHIP TOOLS USED

MPLAB version 1.4
APPENDIX A:  SOURCE CODE

; Transmission Sensor For Remote Car Starter
; Philippe Labonne (PLAB97)
; Start: 5/6/97
; End: 24/6/97

LIST P=12C508
INDF EQU H'0000'
TMR0 EQU H'0001'
PCL EQU H'0002'
STATUS EQU H'0003'
FSR EQU H'0004'
OSCCAL EQU H'0005'
GPIO EQU H'0006'
COUNTER EQU H'0007' ; Counter for wait routine
ACC EQU H'0008' ; Accumulator
REG EQU H'0009' ; Var. for previous state

MOVLW 02Ch ; I/O Pin direction:
TRIS GPIO ; 00101
CLRF REG
CLRF ACC
CLRF COUNTER

CALL Delay1 ; Boucle
CALL Delay1
BSF GPIO,1 ; Set the Infra-Red led ON
CALL Delay1 ; Rise time
BTFSS GPIO,2 ; Look if CAP 1 is OK
GOTO Stop ; Else Stop
BTFSS GPIO,3 ; Look if CAP 2 is OK
GOTO Stop ; Else Stop
BCF GPIO,1 ; Set the Infra-Red led OFF

BTFSC GPIO,5 ; Look if Hand Brake is OK
GOTO Stop ; Else Stop
BTFSC REG,0 ; Look if not already Authorised to start
GOTO Boucle ; If yes: start the loop again
BSF GPIO,0 ; Authorise the car to start
BSF REG,0 ; Save the state

BSF GPIO,4 ; Turn Green Led ON
CALL Delay1 ; Temp On
BCF GPIO,4 ; Turn Green Led OFF
CALL Delay1 ; Temp Off
BSF GPIO,4 ; Turn Green Led ON
CALL Delay1 ; Temp On
BCF GPIO,4 ; Turn Green Led OFF
CALL Delay1 ; Temp Off
BSF GPIO,4 ; Turn Green Led ON
CALL Delay1 ; Temp On
BCF GPIO,4 ; Turn Green Led OFF
CALL Delay1 ; Temp Off
BSF GPIO,4 ; Turn Green Led ON
CALL Delay1 ; Temp On
BCF GPIO,4 ; Turn Green Led OFF
CALL Delay1 ; Temp Off
BSF GPIO,4 ; Turn Green Led ON
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BCF GPIO,4 ; Turn Green Led OFF
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BCF GPIO,4 ; Turn Green Led OFF
CALL Delay1 ; Temp Off
BSF GPIO,4 ; Turn Green Led ON
CALL Delay1 ; Temp On
BCF GPIO,4 ; Turn Green Led OFF
CALL Delay1 ; Temp Off
BSF GPIO,4 ; Turn Green Led ON
CALL Delay1 ; Temp On
;;;----------- Routine Stop si pas correct pour demmarer ----

Stop
BCF GPIO,1 ; Turn infra-red led OFF
BCF GPIO,0 ; Stop Car
BCF REG,0 ; Save Car state
BCF REG,1 ; Save Green Led State
CALL Delay1 ; Wait
GOTO Boucle ; Restart the loop

;;;----------- Short Time Delay ---------------

Delay MOVLW 040h
MOVWF ACC
Innrlp MOVLW 0FFh
MOVWF COUNTER
Inlp DECFSZ COUNTER,1
GOTO Innlp
DECFSZ ACC,1
GOTO Innrlp
RETLW 000h

;;;----------- Long Time Delay ---------------

Delay1 MOVLW 0FFh
MOVWF ACC
Innrlpl MOVLW 0FFh
MOVWF COUNTER
Innlpl DECFSZ COUNTER,1
GOTO Innlp1
DECFSZ ACC,1
GOTO Innrlpl
RETLW 000h

END