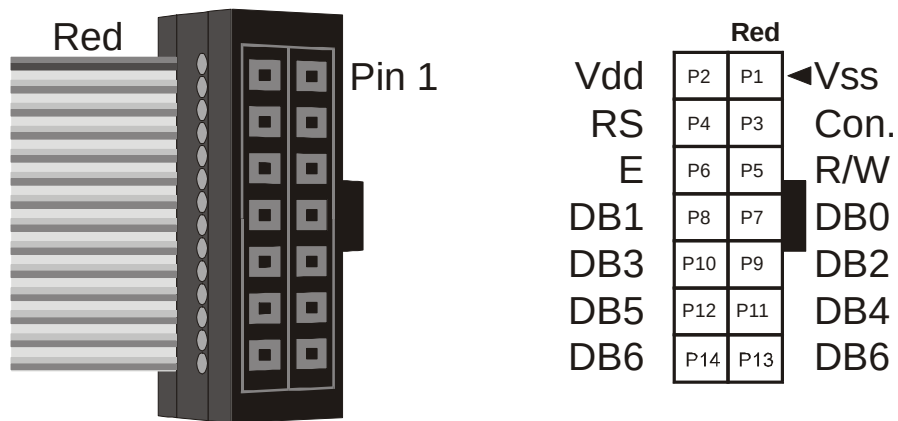
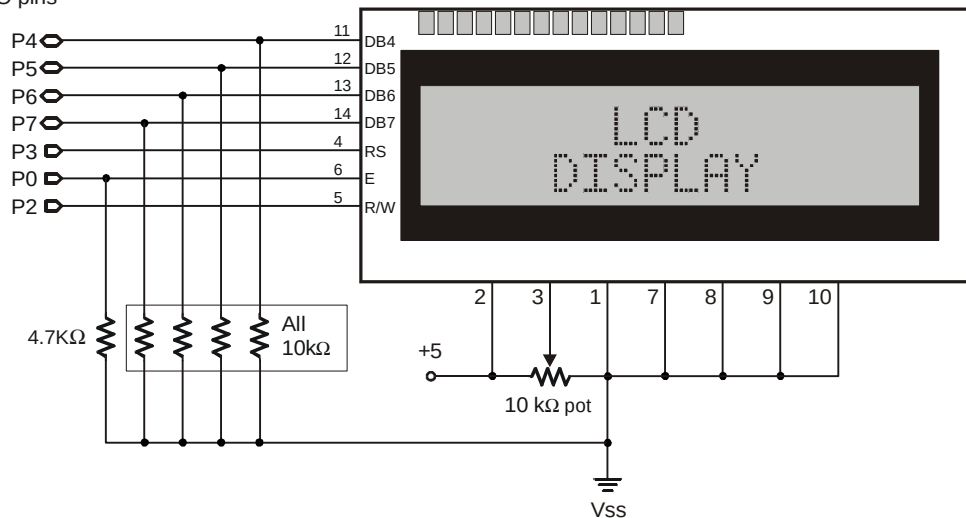




To interface to the LCD in a 4-bit mode you will need set up the LCD in the following manner.
Stamp I/O pins



BASIC Stamp 1 code

```

' =====
' File..... Parallel LCD.bs1
' Purpose... Parallel LCD Display Demo
' Author.... Parallax, Inc.
' E-mail.... support@parallax.com
' {$STAMP BS1}
' {$PBASIC 1.0}
' -----[ Program Description ]-----
' This program demonstrates using a Hitachi-compatible Parallel LCD Display
' -----[ I/O Definitions ]-----
SYMBOL      E = 0                ' Enable Pin. 1 = Enabled
SYMBOL      RS = 3              ' Register Select. 0 = Instruction
SYMBOL      RW = 2              ' Read / Write control. 0 = Write
' -----[ Variables ]-----
SYMBOL      char = B3           ' Character sent to LCD
SYMBOL      temp = B4           ' Temp Variable
' -----[ EEPROM Data ]-----
EEPROM ("Hello, this is the LCD demo.")
' -----[ Initialization ]-----
Begin:
  LET PINS = 0                  ' Clear The Output Lines
  LET DIRS = %11111000         ' One Input, 7 Outputs
  PAUSE 200                     ' Wait 200 ms For LCD To Reset

```

```

LOW RW                                ' Puts LCD Into Write Mode
Init LCD:
LET PINS = %00110000                  ' Wakes Up LCD
PULSOUT E,1                           ' Send Data Three Times
PAUSE 10
PULSOUT E,1
PAUSE 10
PULSOUT E,1
PAUSE 10
LET PINS = %00100000                  ' Function Set, 4-bit Operation
PULSOUT E,1
LET char = %00101000                  ' Set 4-bit Operation
GOSUB Wr LCD                           ' Clears The LCD Screen
LET char = 1
GOSUB Wr LCD                           ' Set Cursor Direction
LET char = 6
GOSUB Wr LCD                           ' Sets Cursor To Underline
LET char = 14
GOSUB Wr LCD                           ' Prepare To Send Characters
HIGH RS
' -----[ Program Code ]-----
Main:
FOR B6 = 0 TO 27                      ' Read Data From EEPROM To Display
  READ B6, char
  IF B6 = 15 THEN Next Line
  GOSUB Wr LCD
Out:
NEXT
END                                    ' End Of Code
' -----[ Subroutines ]-----
Wr LCD:
temp = char & %11110000               ' Write The Character In B3 To LCD
                                        ' Logical AND Data Of High Byte Of
                                        ' I/O Pins
PINS = PINS & %00001000 | temp         ' Logical OR The Data Leaving RS
                                        ' Pin In An Unchanged State
PULSOUT E,1                           ' Clocks Out Data
PAUSE 10
temp = char & %00001111 * 16           ' Logical AND Data To Low Byte Of
                                        ' I/O Pins And Shifts To The Left
PINS = PINS & %00001000 | temp         ' Logical ORs The Data Leaving RS
                                        ' Pin In An Unchanged State
PULSOUT E,1                           ' Clocks Out Data
PAUSE 100
RETURN
Next line:
LOW RS
LET char = 128 + 64                   ' Places Cursor On Line 2
GOSUB Wr LCD
HIGH RS                               ' Puts LCD Into Display Mode
READ B6, char
GOSUB Wr LCD
GOTO Out

```

BASIC Stamp 2, 2e and 2sx code

```

' =====
' File..... Parallel LCD 2X16.bs2
' Purpose... Parallel LCD Display Demo
' Author.... Parallax, Inc.
' E-mail.... support@parallax.com
' {$STAMP BS2}
' {$PBASIC 2.5}
' -----[ Program Description ]-----
' This program demonstrates using a Hitachi-compatible Parallel LCD Display
' This code works with the BS2, BS2e and BS2sx
' -----[ I/O Definitions ]-----
E          PIN      0                ' Enable Pin For LCD
RW         PIN      2                ' R/W Pin For LCD
RS         PIN      3                ' LCD Register Select
                                        ' 0 = Instruction, 1 = Text
' -----[ Variables ]-----
char       VAR      Byte             ' Character To Send To LCD
inst       VAR      char             ' Induction To Send To LCD
index      VAR      Word             ' Character Pointer
temp       VAR      Byte             ' Temp Variable
' -----[ EEPROM Data ]-----
DATA "Hello, this is the LCD demo."  ' Message To Send To LCD
' -----[ Initialization ]-----

```

```

Initialize:
  LOW RW                                ' Set LCD To Write Mode
  OUTS = %000000000000000000          ' Set All Output Low
  DIRS = %0000000011111111           ' Set I/O Direction
  GOSUB Init_Lcd                        ' Initialize The LCD Display
' -----[ Program Code ]-----
Main:
  FOR temp = 0 TO 27                    ' 28 Characters
    IF temp = 15 THEN                  ' Check For End Of Line
      GOSUB Next_Line                 ' Jump To Next Line
    ENDIF
    READ temp, char                    ' Read Next Character From EEPROM
    GOSUB Send_Text                   ' Send Character To LCD Display
  NEXT
END
' -----[ Subroutines ]-----
Init_Lcd:
  PAUSE 200
  OUTS = %00110000                     ' Reset The LCD
  PULSOUT E,1                          ' Send Command Three Times
  PAUSE 10
  PULSOUT E,1
  PAUSE 10
  PULSOUT E,1
  PAUSE 10
  OUTS = %00100000                     ' Set To 4-bit Operation
  PULSOUT E,1
  Inst = %00101000                     ' Function Set (2-Line Mode)
  GOSUB Send_Inst
  Inst = %00001110                     ' Turn On Cursor
  GOSUB Send_Inst
  Inst = %00000110                     ' Set Auto-Increment
  GOSUB Send_Inst
  Inst = %00000001                     ' Clears LCD
  GOSUB Send_Inst
  Inst = 14                            ' Set Cursor To Underline
  GOSUB Send_Inst
  RETURN
Send_Inst:
  LOW RS                                ' Set Instruction Mode
  OUTB = Inst.HIGHNIB                  ' Send High Nibble
  PULSOUT E,1
  OUTB = Inst.LOWNIB                  ' Send Low Nibble
  PULSOUT E,1
  HIGH RS                              ' Set LCD Back To Text Mode
  RETURN
Send_Text:
  OUTB = Char.HIGHNIB                  ' Send High Nibble
  PULSOUT E,1
  OUTB = Char.LOWNIB                  ' Send Low Nibble
  PULSOUT E,1
  PAUSE 100
  RETURN
Next_Line:
  Inst = 128+64                        ' Move Cursor To Line 2
  GOSUB Send_Inst
  RETURN

```

BASIC Stamp 2p24, 2p40 2pe and 2px24 code

```

' =====
' File..... Parallel LCD 2X16.bsp
' Purpose... Parallel LCD Display Demo
' Author.... Parallax, Inc.
' E-mail.... support@parallax.com
' {$STAMP BS2p}
' {$PBASIC 2.5}
' -----[ Program Description ]-----
' This program demonstrates using a Hitachi-compatible Parallel LCD Display
' This code works with the BS2p24, BS2p40, BS2pe and BS2px24
' -----[ I/O Definitions ]-----
Lcd      PIN      0      ' LCD Enable Pin
' -----[ Variables ]-----
temp     VAR      Byte
char     VAR      Byte
' -----[ Initialization ]-----
Init_Lcd:

```

```

PAUSE 1000
FOR temp = 0 TO 2
  LCDCMD Lcd, 48          ' Reset LCD (Send 3 times)
  PAUSE 5                ' Delay Require By LCD Specs
NEXT
LCDCMD Lcd, 32          ' Set 4-bit Mode
LCDCMD Lcd, 40          ' Set 2-line Mode
LCDCMD Lcd, 12          ' Turn On Display With No Cursor
LCDCMD Lcd, 6           ' Set To Auto-Increment Cursor
LCDCMD Lcd, 1           ' Clear Display
' -----[ Main Routine ]-----
Main:
DO
  LCDOUT Lcd, 1, ["Hello, this is"] ' Clear LCD & Print Line 1 Text
  LCDOUT Lcd, 192, ["the LCD demo."] ' Move To Line 2 & Print Text
  PAUSE 3000                      ' Wait A Few Seconds
  LCDCMD Lcd, 1                   ' Clear LCD
  PAUSE 500                       ' Wait 1/2 Second
LOOP                              ' Do It Again
END

```