

Supplement Guide For Setting Up LCD Display

List of Commands for LCD Display

COMMAND	BASE CODE	WHAT HAPPENS
Clear Display	0000000 1 b	Display is cleared
Cursor Home	000000 1 *b	Cursor goes home (00)
Entry Mode	00000 1 XXb	How characters displayed
Display Control	0000 1 XXXb	On/Off, Cursor, Blink
Cursor Display Shift	000 1 00**b	Cursor Shift control
8-Bit or 4-Bit Setup	00 1 XXX**b	8-Bit/4-Bit, 1 or 2 lines
CGRAM Setup	0 1 XXXXXXb	Character Generator
Sets DDRAM Address	1 XXXXXXXb	Sets DDRAM Address

* = Bits that are ignored (in the program code just make them a "0")
X = Bits that an option needs to be selected

Selection of 8-Bit/2 Line mode

COMMAND: Selecting 8-Bit/4-Bit mode, 1 or 2 Lines (001**XXX**b)**

BIT-0	Ignored (make = 0)
BIT-1	Ignored (make = 0)
BIT-2 = 0	Font of characters is 5x7 Dots (always select this option)
BIT-2 = 1	Font of characters is 5x10 Dots (not common)
BIT-3 = 0	Information displayed on 1 line
BIT-3 = 1	Information displayed on 2 lines (always select this option)
BIT-4 = 0	Commands and Data sent in 4-Bit format
BIT-4 = 1	Commands and Data sent in 8-Bit format

#001**11000b** Selects 8-bit mode/2 line mode for entry of information

Look at the example code listings to see how the binary number for this command is sent to the LCD display.

Nothing to see ... the LCD is set up for 8-Bit/2 Line entry of information

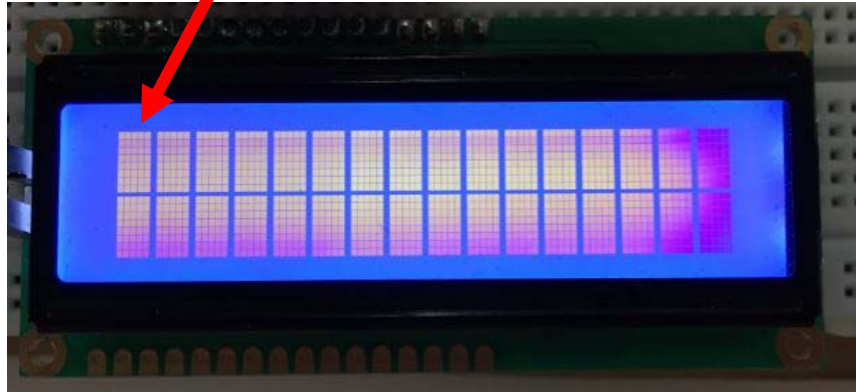


Clear Display

COMMAND: Clear Display (00000001**b)**

#00000001**b** Clears Display and places cursor at home position

Home Position (DDRAM address 00)

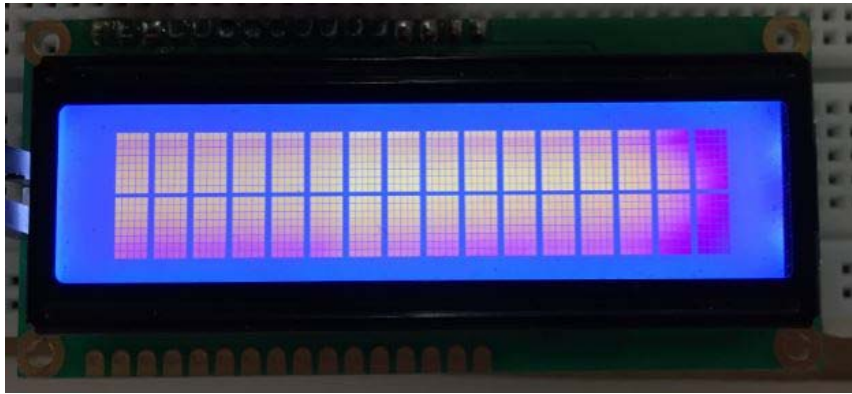


Note: After this Command a 5 millisecond or longer delay is needed

Setting where you want the characters displayed

COMMAND: Sets DDRAM Address (**1**XXXXXXXb)

This instruction sets the position on the 16x2 LCD display where the first character will be displayed. Arriving at the correct number to enter can be confusing, however, follow the example below. There are 32 possible DDRAM addresses (defined by a unique number for each location). To select a particular location, add the unique number to the base number (#10000000b) as shown below.



32 Possible Character Spaces

DDRAM Addresses (Decimal Notation)

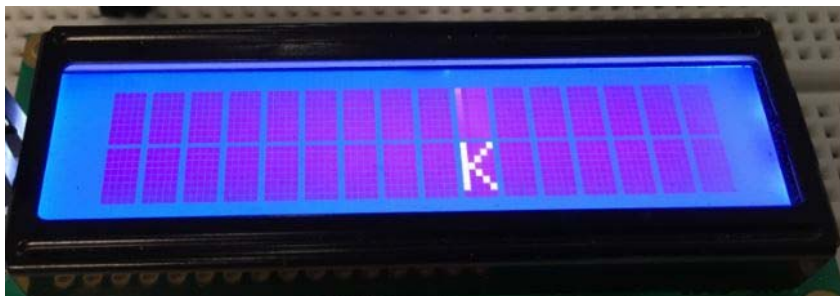
00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79

EXAMPLE (Letter "K" placed in DDRAM address 73)

$$[\#10000000b = 128 \text{ (base number)}] + [\#01001001b = 73]$$

$$[128 + 73] = 201 \quad \text{Conversion to Binary} = \#11001001b$$

#11001001b Places "K" in DDRAM Address 73



The Letter "K" in DDRAM address 73

Display Control

COMMAND: Display Control (0000**1**XXXb)

BIT-0 = 0 Cursor Blinking OFF
BIT-0 = 1 Cursor Blinking ON
BIT-1 = 0 Cursor OFF
BIT-1 = 1 Cursor ON
BIT-2 = 0 Display OFF
BIT-2 = 1 Display ON

#0000**1**000b Display OFF, Cursor OFF, Cursor Blinking OFF



#0000**1**100b Display ON, Cursor OFF, Cursor Blinking OFF



#0000**1**110b Display ON, Cursor ON, Cursor Blinking OFF



#0000**1**111b Display ON, Cursor ON, Cursor Blinking ON



Display Shift (Left or Right)

COMMAND: Display Shift/Cursor Move (Right or Left) (000001XXb)

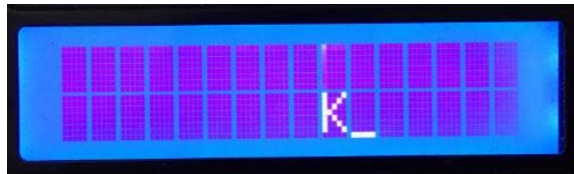
BIT-0 = 0 Display shift OFF
BIT-0 = 1 Display shift ON
BIT-1 = 0 Cursor moves one space to the left (for next character)
BIT-1 = 1 Cursor moves one space to the right (for next character)

#00000100b Display Shift OFF / Cursor to the Left



(The K stays in DDRAM 73 while the next characters go in on the Left)

#00000110b Display Shift OFF / Cursor to the Right



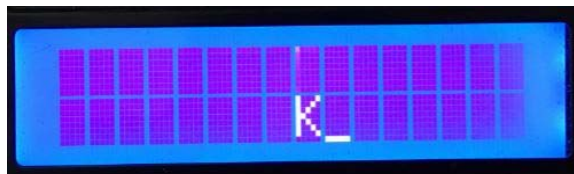
(The K stays in DDRAM 73 while the next characters go in on the right)

#00000101b Display Shift ON / Cursor to the Left



(The Cursor stays in DDRAM 73 and stays on the Left while the K moves)

#00000111b Display Shift ON / Cursor to the Right



(The Cursor stays in DDRAM 73 and stays on the Right while the K moves)