



## SOFTWARE COMMANDS

Busy Time 25uSec unless stated below

Instruction +busy time	Data Format	Description																																																																																									
Backspace	08H	Moves the cursor left by one character. If the cursor is at the left end of the bottom line the cursor moves to the right end of the top line. If the cursor is at the left end of the top line no cursor movement is made.																																																																																									
Horizontal Tab 50us on scroll	09H	Moves the cursor right by one character. If the cursor is at the right end of the top line the cursor moves to the left end of the bottom line. If the cursor is at the right end of the bottom line the action depends on the write mode currently selected. In DC1 mode the cursor moves to the left end of the top line. In DC2 mode the entire display contents is scrolled up by one line, the bottom line is cleared and the cursor moves to the left end of the bottom line.																																																																																									
Line Feed 50us on scroll	0AH	Moves the cursor down by one line. If the cursor is on the bottom line the action depends on the write mode currently selected. In DC1 mode the cursor moves to the top line. In DC2 mode the entire contents of the display is scrolled up by one line and no cursor movement is made.																																																																																									
Form Feed	0CH	Moves the cursor to the top left end of the display.																																																																																									
Carriage Return	0DH	Moves the cursor to the left end of the current line.																																																																																									
Clear 50us	0EH	Clear all displayed characters. No cursor movement is made.																																																																																									
Overwrite mode (DC1)	11H	Specifies character overwrite mode. (default)																																																																																									
Vertical scroll mode (DC2)	12H	Specifies vertical scroll mode.																																																																																									
Cursor on (DC5)	15H	A blinking full block is displayed at the cursor position. The blink rate can be specified using the Blink Speed Control command.																																																																																									
Cursor off (DC6)	16H	No cursor is displayed.																																																																																									
International Font	18H	All subsequent characters displayed will be from the International font. This font can also be selected as the default by using the JA hardware jumper link (OPEN).																																																																																									
KATAKANA Font	19H	All subsequent character displayed will be from the KATAKANA font. This font can also be selected as the default by using the JA hardware jumper link (LINKED).																																																																																									
Euro Symbol	1AH	This command enables the Euro currency mark at location ADH in the International font. Sending the International Font command (or after a reset) restores the character at location ADH to a blank (this is the default condition). This will affect any existing ADH characters already on the display.																																																																																									
User Defined Font	1BH + 43H + character code + data byte 1 + data byte 2 + data byte 3 + data byte 4 + data byte 5	<p>Define a user character. Up to 16 user characters can be defined and stored by the module. The specified character code can be 00H – FFH. Command codes can be overwritten with a UDF so be aware that doing so will disable that command. All UDF's are lost on power off or reset. If more than 16 UDF's are defined the older definitions are overwritten.</p> <p style="text-align: center;">Bit / Byte assignment</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>7</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> <td>0</td> </tr> <tr> <td>Byte 1</td> <td>P8</td> <td>P7</td> <td>P6</td> <td>P5</td> <td>P4</td> <td>P3</td> <td>P2</td> <td>P1</td> </tr> <tr> <td>Byte 2</td> <td>P16</td> <td>P15</td> <td>P14</td> <td>P13</td> <td>P12</td> <td>P11</td> <td>P10</td> <td>P9</td> </tr> <tr> <td>Byte 3</td> <td>P24</td> <td>P23</td> <td>P22</td> <td>P21</td> <td>P20</td> <td>P19</td> <td>P18</td> <td>P17</td> </tr> <tr> <td>Byte 4</td> <td>P32</td> <td>P31</td> <td>P30</td> <td>P29</td> <td>P28</td> <td>P27</td> <td>P26</td> <td>P25</td> </tr> <tr> <td>Byte 5</td> <td>-</td> <td>-</td> <td>-</td> <td>COM</td> <td>DP</td> <td>P35</td> <td>P34</td> <td>P33</td> </tr> </table> <p style="text-align: right;">Dot assignment</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>P1</td><td>P2</td><td>P3</td><td>P4</td><td>P5</td></tr> <tr><td>P6</td><td>P7</td><td>P8</td><td>P9</td><td>P10</td></tr> <tr><td>P11</td><td>P12</td><td>P13</td><td>P14</td><td>P15</td></tr> <tr><td>P16</td><td>P17</td><td>P18</td><td>P19</td><td>P20</td></tr> <tr><td>P21</td><td>P22</td><td>P23</td><td>P24</td><td>P25</td></tr> <tr><td>P26</td><td>P27</td><td>P28</td><td>P29</td><td>P30</td></tr> <tr><td>P31</td><td>P32</td><td>P33</td><td>P34</td><td>P35</td></tr> </table> <p style="text-align: right;">COM </p>		7	6	5	4	3	2	1	0	Byte 1	P8	P7	P6	P5	P4	P3	P2	P1	Byte 2	P16	P15	P14	P13	P12	P11	P10	P9	Byte 3	P24	P23	P22	P21	P20	P19	P18	P17	Byte 4	P32	P31	P30	P29	P28	P27	P26	P25	Byte 5	-	-	-	COM	DP	P35	P34	P33	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26	P27	P28	P29	P30	P31	P32	P33	P34	P35
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Cursor Moving	1BH + 48H + position	<p>The cursor is moved to the specified position. The relationship between the position value and the display is as follows:-</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>Left end</td> <td>2<sup>nd</sup> col</td> <td>3<sup>rd</sup> col</td> <td>-</td> <td>Right end</td> </tr> <tr> <td>Top</td> <td>00H</td> <td>01H</td> <td>02H</td> <td>-</td> <td>13H</td> </tr> <tr> <td>Bottom</td> <td>14H</td> <td>15H</td> <td>16H</td> <td>-</td> <td>27H</td> </tr> </table>		Left end	2 <sup>nd</sup> col	3 <sup>rd</sup> col	-	Right end	Top	00H	01H	02H	-	13H	Bottom	14H	15H	16H	-	27H																																																																							
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Luminance	1BH + 4CH + luminance	<p>The display luminance can be set to one of 4 levels.</p> <p>luminance = 00H – 3FH specifies 25%</p> <p>luminance = 40H – 7FH specifies 50%</p> <p>luminance = 80H – BFH specifies 75%</p> <p>luminance = C0H – FFH specifies 100% (default)</p>																																																																																									
Flickerless Writing Mode	1BH + 53H	Set flickerless write mode. By default, priority is given to data communication and display flicker can occur if data is sent to the display continuously. If flickerless writing mode is specified, priority is given to display refresh to avoid possible flicker. Command and data busy times will be up to 200us longer when this mode is set.																																																																																									
Blink Speed Control	1BH + 54H + speed	The blink rate of the cursor can be specified. Rate = speed x 30ms. (default=14H)																																																																																									
Initialise 80us	1BH + 49H	Clear the display, erase any defined characters, set the cursor position to the top left of the display and reset all settings to defaults.																																																																																									
Character Write 50us on scroll	20H – FFH	Display the specified character from the currently selected font (or UDF is defined) at the current cursor position. After the character is written to the display a horizontal tab automatically follows.																																																																																									