Input/output device commands

This section lists the commands and their usage for the SurePOS 500/600 Series I/O devices.

Character display (VFD) commands

The Integrated character display and distributed character display use the same command sets.

This section describes the following character display commands:

- Emulation mode select
- Character set select
- User character definition
- Brightness control
- Alphanumeric message scroll
- Backspace
- Horizontal tab
- Line feed
- Carriage return
- Test
- Display position
- Normal display
- Vertical scroll
- Cursor on
- Cursor off
- Reset
- Null

Note: The command code format shown in the following topics consists of the hex value followed by the ASCII representation of that value within brackets.

Emulation mode select (00) <NULL>

00 *nn*

Purpose:

Sets the specified emulation mode.

00 Logic Controls Emulation Mode (default)

01 IBM mode

Example:

This example sets Logic Controls emulation mode:

```
00 00
```

Character set select (02) <STX>

Note: This command is effective only in IBM Mode.

02 *nn*

Purpose:

Selects the specified character set.

00 Modified IBM code page 437 (US/European, power-on default)

01 Modified IBM code page 897 (Katakana)

02 Modified IBM code page 858 (Multilingual International)

03 Modified IBM code page 852 (Central Europe)

04 Modified IBM code page 855 (Cyrillic)

05 Modified IBM code page 857 (Turkey)

06 Modified IBM code page 862 (Israel)

07 Modified IBM code page 863 (Canadian French)

08 Modified IBM code page 864 (Arabic)

09 Modified IBM code page 865 (Nordic)

0A Modified IBM code page 808 (Cyrillic - Russia)

0B Modified IBM code page 869 (Greece)

Example:

This example selects the US/European character set:

```
02 00
```

User character definition (03) <EXT>

03 *nn*

Purpose:

Defines a custom character.

Logic Controls Emulation Mode

The byte that follows the command byte contains an ASCII character between X'20' and X'7F' of a keyboard key to be redefined. This byte is followed by five bytes defining the bit patterns of the user-defined character. Logic Controls Emulation Mode allows only one keyboard key to be redefined. This means that there is only one user-definable character in this mode. Once a key is redefined, any occurrence of that character on the display will change to the user-defined character. If a new key is redefined, the previously redefined key is restored to the original character in all places on the display and the newly redefined key is changed to the user-definable character. Table 23 on page 52 shows the format of these five bytes.

Note: A hyphen character in the table indicates a do-not-care bit. The other values relate to the character pixel positions shown in the diagram following the table. A value of 1 in the appropriate place in the data stream indicates that the related pixel position is ON; a 0 indicates that it is OFF.

Table 23. User character definition: Logic Controls Emulation Mode

Byte #	Bit							
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1	P8	P7	P6	P5	P4	P3	P2	P1
2	P16	P15	P14	P13	P12	P11	P10	P9
3	P24	P23	P22	P21	P20	P19	P18	P17
4	P32	P31	P30	P29	P28	P27	P26	P25
5	-	-	-	-	-	P35	P34	P33

* These character definitions are maintained for application compatibility with displays with 5x8 character boxes.

```
  ←– —– –5 pixels wide – – – –→
 P1    P2    P3    P4    P5   ↑
 P6    P7    P8    P9    P10  |
P11   P12   P13   P14   P15   |
P16   P17   P18   P19   P20   7 pixels high
P21   P22   P23   P24   P25   |
P26   P27   P28   P29   P30   |
P31   P32   P33   P34   P35   ↓
```

IBM Mode

IBM Mode allows nine user defined characters to be defined. See Table 24 for defined characters:

Table 24. User character definition: IBM Mode

1. X'15'	6. X'1A'
2. X'16'	7. X'1C'
3. X'17'	8. X'1D'
4. X'18'	9. X'1E'
5. X'19'	

The byte that follows the command byte represents an address between X'15' and X'1A', or between X'1C' and X'1E' in the currently selected character set. This byte is followed by eight bytes, which define the actual bit patterns of the user-defined character. Table 25 on page 53 shows the format of these eight bytes.

Note: A hyphen character in the table indicates a do-not-care bit. The other values relate to the character pixel positions shown in the diagram following the table. A value of 1 in the appropriate place in the data stream indicates that the related pixel position is ON; a 0 indicates that it is OFF.

Table 25. User character definition: IBM emulation mode

Byte #	Bit							
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1	-	-	-	P1	P2	P3	P4	P5
2	-	-	-	P6	P7	P8	P9	P10
3	-	-	-	P11	P12	P13	P14	P15
4	-	-	-	P16	P17	P18	P19	P20
5	-	-	-	P21	P22	P23	P24	P25
6	-	-	-	P26	P27	P28	P29	P30
7	-	-	-	P31	P32	P33	P34	P35
8*	-	-	-	-	-	-	-	-

* These user character definitions are maintained for application compatibility with displays with 5x8 character boxes.

```
  ←– – – –5 pixels wide – – – –→
 P1    P2    P3    P4    P5   ↑
 P6    P7    P8    P9    P10  |
P11   P12   P13   P14   P15   |
P16   P17   P18   P19   P20   7 pixels high
P21   P22   P23   P24   P25   |
P26   P27   P28   P29   P30   |
P31   P32   P33   P34   P35   ↓
```

Brightness control (04) <EOT>

04 *nn*

Purpose:

Specifies a brightness setting for the display, in a percentage. The power-on default is 100%.

```
X'FF'   100%
X'60'    60%
X'40'    40%
X'20'    20%
```

Alphanumeric message scroll (05) <ENG>

05 *xxx...*

Purpose:

Specifies a message of up to 45 characters to continuously scroll across the top line of the display. (Any text on the bottom line does not change.) Data received after the 45th character are ignored except for a carriage return (X'0D'). The message starts to display when the carriage return command is received. If the cursor position is on the top line when this command is received, it is moved to the first position on the bottom line. If it is on the bottom line, its position does not change. Data continues scrolling on the top line until a valid character (backspace, horizontal tab, line feed,

carriage return, or display position command is written to the top line. The test and reset commands stop the scrolling message regardless of the display position.

Backspace (08) <BS>

08

Purpose:

Decrements the cursor position by one and clears any character displayed in that position. If the write position is at the lower left, the position is moved to the upper right, and if it is at the upper left, it is moved to the lower right. This commands stops the scrolling alphanumeric message if the cursor position is on the top line when this command is sent.

Horizontal tab (09) <HT>

09

Purpose:

Increments the cursor position by one. No characters are erased. This command stops the scrolling message if the cursor position is on the top line when the command is sent. At the end of a line, the display behavior is determined by the state of the display control mode as follows:

Normal Display Control Mode (DC1)

If the cursor is at the upper right position, it is moved to the lower left position. If the cursor is at the lower right position, it is moved to the upper left position.

Vertical Scroll Display Control Mode (DC2)

If the cursor is at the upper right position, it is moved to the lower left position. If the cursor is at the lower right position, the characters displayed on the bottom line are moved to the top line, the bottom line is cleared, and the cursor is moved to the lower left position.

Line feed (0A) <LF>

0A

Purpose:

The display behavior is determined by the state of the display control mode as follows:

Normal Display Control Mode (DC1)

The cursor is moved to the same position in the complementary line. In this mode, a line-feed command stops the scrolling alphanumeric message if the cursor is on the top line when this command is sent.

Vertical Scroll Display Control Mode (DC2)

If the cursor is on the top line, it is moved to the complementary position on the bottom line. If the cursor position is on the bottom line, all characters on that line are moved to the top line, the bottom line is cleared, and the cursor position is unchanged. This command always stops the scrolling alphanumeric message.

Carriage return (0D) <CR>

0D

Purpose:

Causes the cursor to move to the leftmost position of the current line. This command stops the scrolling alphanumeric message if the cursor position is on the top line when this command is sent.

Test (0F) <SI>

0F

Purpose:

Causes the first 40 characters in the currently selected character set to be displayed once. At the end of the test, a test pattern is written that turns all pixels ON. At the end of the test, the display is cleared and is reset to the power-on state as described at “Reset (1F) <US>” on page 56.

Display position (10) <DLE>

10 *nn*

Purpose:

Changes the cursor position. The byte that follows the command byte indicates the character position where the next data-string write operation is to start. Any values greater than X'27' are ignored and the cursor position remains unchanged. This command stops the scrolling alphanumeric message if the cursor position is on the top line when this command is sent.

X'00'	Top left
X'13'	Top right
X'14'	Bottom left
X'27'	Bottom right

Normal-display control mode (11) <DC1>

11

Purpose:

Sets normal display-control mode (DC1) and permits data to be written to either line. After a character is written, the cursor moves one position to the right. When the display position is at the last position of the top line, the cursor moves to the first position of the bottom line. When the display position is at the last position of the bottom line, the cursor moves to the first position of the top line. The display remains in DC1 mode until a DC2 mode command is issued, a reset command is issued, or power is removed from the display.

Vertical-scroll display control mode (12) <DC2>

12

Purpose:

Sets vertical-scroll display control mode (DC2) and permits data to be

written to either line. When the display position is at the last position of the top line, the cursor moves to the first position of the bottom line. When either valid character data or a Horizontal Tab command is sent to the last position of the bottom line, the data on the bottom line is transferred to the top line and the cursor is moved to the lower left position. Note that a Carriage Return command does not cause the data on the bottom line to be transferred to the top line. This mode is the default setting for power on and reset. The display remains in DC2 mode until a DC1 mode command is issued.

Cursor on (13) <DC3>

13

Purpose:

Turns on the cursor. The command is the power-on default setting.

Cursor off (14) <DC4>

14

Purpose:

Turns off the cursor.

Reset (1F) <US>

1F

Purpose:

Causes the display to reset some programmable parameters to the power-on state, which is defined as:

- Cursor on.
- Scrolling alphanumeric message off.
- All character positions filled with X'20'.
- Write position for next write at position X'00' (top left).
- Default code page (437) selected.
- DC2 mode enabled.
- Default (Logic Controls) emulation mode selected.
- Brightness set to 100%.
- IBM user-defined characters not erased. The Logic Controls user-defined, character key is reset.

All byte values between X'00' and X'1F' not defined in this section are ignored by the display in Logic Controls mode. User-defined characters in the IBM mode that have not been defined previously are spaces.

Null VFD Commands

(X'06'), (X'1B', X'06'), (X'07'), (X'1B'), X'07')

Purpose:

These are null commands for both integrated and distributed display modules. They will have no effect on the operation of the display.: