

EPSON OPOS ADK MANUAL

**APPLICATION DEVELOPMENT
GUIDE**

LineDisplay (DM-D70)

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Section 1. Introduction

This manual describes the method of use and related items, including device-specific precautions, when the LineDisplay device is used with EPSON OPOS ADK.

Before the LineDisplay can be used, the EPSON OPOS ADK should be installed and the devices to be used should be set using the SetupPOS utility. For setting methods, please see the Section 2 of this manual.

This manual applies to the following devices.

- DM-D70

Compatibility mode

The compatibility mode for upward compatibility was added in OPOS Ver2.60.

For the details of the compatibility mode, please refer to “EPSON OPOS ADK MANUAL APPLICATION DEVELOPMENT GUIDE Compatibility Mode”.

Section 2. Details on Settings

This section describes how to make the settings for the LineDisplay.

2.1 Device Information

The DeviceDescription and DeviceName for each model are as follows.

Device Name	I/F	DeviceDescription	DeviceName
DM-D70	S	EPSON DM-D70 (TM USB Connection) LineDisplay	DM-D70
	P	EPSON DM-D70P (TM USB Connection) LineDisplay	DM-D70P
	U	EPSON DM-D70U (TM USB Connection) LineDisplay	DM-D70U
	E	EPSON DM-D70E (TM USB Connection) LineDisplay	DM-D70E
	B	EPSON DM-D70B (TM USB Connection) LineDisplay	DM-D70B

I/F indicate the connected interface.

The view of I / F is as follows.

S: Serial

P: Parallel

U: USB

E: Ethernet

B: Bluetooth

In USB I/F, the standalone connection can be selected.

Note TM USB Connection means connecting DM-D70 to USB Type-A port of the printer directly.

2.2 References of Firmware Versions

Refer to the release notes (Relnote.txt).

2.3 Settings of DIP Switches and Hardware

Not applicable

2.4 Setting of Devices

The SetupPOS utility should be used for setting devices. Regarding how to use the SetupPOS utility, please refer to "EPSON OPOS ADK MANUAL User's Manual (Installer/ SetupPOS/ TMUSB)".

2.4.1 Device Specific Settings

DM-D70 following device-specific settings can be made from the SetupPOS utility.

Item	Setting value
Display mode	Standard mode
	Fixed row and column mode
Layout	^{Note} It varies depending on the value of "Screen mode".
CharacterSet	437, 997

2.5 Port Information

All display settings are exactly the same as the connected printer.

1) Port information when using serial port

Not applicable

2) Port information when using parallel port

Not applicable

3) Port information when using USB port

Not applicable

4) Port information when using Ethernet port

Not applicable

5) Port information when using Bluetooth port

Not applicable

Section 3. Function Details

This section describes the functions of the LineDisplay device in details. Supplementary explanation of the parts not described in detail in "UPOS" is also given here.

3.1 Property Set Values and Default Values

3.1.1 Capability Set Values

The Capability values are described below.

Capability	Set value
CapBitmap	FALSE
CapBlink	DISP_CB_NOBLINK
CapBlinkRate	FALSE
CapBrightness	TRUE
CapCharacterSet	DISP_CCS_UNICODE
CapCompareFirmwareVersion	FALSE
CapCursorType	DISP_CCT_NONE
CapCustomGlyph	FALSE
CapDescriptors	FALSE
CapHMarquee	TRUE
CapICharWait	TRUE
CapMapCharacterSet	FALSE
CapPowerReporting	OPOS_PR_STANDARD
CapReadBack	DISP_CRB_SINGLE
CapReverse	DISP_CR_NONE
CapScreenMode	FALSE
CapStatisticsReporting	TRUE
CapUpdateFirmware	FALSE
CapUpdateStatistics	TRUE
CapVMarquee	FALSE

3.1.2 List Properties

The List Property values are described below.

Property	Set value
CharacterSetList	130,131,150,151,152,153,154,155,437,720,737,775,850,851,852,853,855,857,858,860,861,862,863,864,865,866,869,997,998,999,1098,1125,1250,1251,1252,1253,1254,1255,1256,1257,1258
CustomGlyphList ^{*1}	""
ScreenModeList	2x20 ^{*2}

^{*1} The list will be blank because CustomGlyph is not supported.

^{*2} The value varies depending on the "Layout" set in "[2.4.1 Device Specific Settings](#)" or the "Layout" set in DirectIO method "DISP_DI_LAYOUT" parameter.

3.1.3 Other Property Value

The values of the properties related to the layout are listed below.

Property	Set value
DeviceWindows	4
DeviceRows	2 ^{*1}
DeviceColumns	20 ^{*1}
DeviceDescriptors	0
DeviceBrightness	100
CharacterSet	997 ^{*2}
GlyphHeight	0
GlyphWidth	0
MapCharacterSet	FALSE
MaximumX	0
MaximumY	0
ScreenMode	0
ScreenModeList	2x20 ^{*1}

^{*1} The value varies depending on the "Layout" set in "[2.4.1 Device Specific Settings](#)" or the "Layout" set in DirectIO method "DISP_DI_LAYOUT" parameter.

^{*2} "437" or "997" is set as the initial value according to the "CharacterSet" set in "[2.4.1 Device Specific Settings](#)".

3.1.4 Property Default Set Values and Setting Ranges

- Brightness setting

Set value	DeviceBrightness
0-39	20%
40-59	40%
60-79	60%
80-100	100% ^{*1}

^{*1} Default Value

● Relationship between CharSet and CodePage

CharacterSet	130	131	150	151	152
Page No. Set Value	Page30	Page31	Page15	Page39	Page40

CharacterSet	153	154	155	437	720
Page No. Set Value	Page42	Page43	Page53	Page0	Page32

CharacterSet	737	775	850	851	852
Page No. Set Value	Page14	Page33	Page2	Page11	Page18

CharacterSet	853	855	857	858	860
Page No. Set Value	Page12	Page34	Page13	Page19	Page3

CharacterSet	861	862	863	864	865
Page No. Set Value	Page35	Page36	Page4	Page37	Page5

CharacterSet	866	869	998	999	1098
Page No. Set Value	Page17	Page38	Page0	Page16	Page17

CharacterSet	1125	1250	1251	1252	1253
Page No. Set Value	Page44	Page45	Page46	Page16	Page47

CharacterSet	1254	1255	1256	1257	1258
Page No. Set Value	Page48	Page49	Page50	Page51	Page52

3.2 Method Details

3.2.1 CreateWindow

The CreateWindow parameters are below.

Method	Parameter	Limit
CreateWindow	WindowHeight	~1024
	WindowWidth	~1024

3.3 Supplementary explanation of functions

This section describes the "Display mode" and "layout" that can be set with the SetupPOS utility.

3.3.1 "Display mode" and "Layout"

The combinations of "Display mode" and support devices are as follows.

Models with limited combinations are as follows.

TM-T88Series

Device Name	Standard mode	Fixed row and column mode
TM-T88VI	x	O
TM-T88VII	O	O

O:Support x:Not support

TM-m30Series

Device Name	Standard mode	Fixed row and column mode
TM-m30	x	O
TM-m30II	x	O
TM-m30II-H	O ^{*1}	O
TM-m30II-S	O ^{*1}	O
TM-m30II-NT	O ^{*1}	O
TM-m30II-SL	O ^{*1}	O
TM-m30III	O	O

O:Support x:Not support

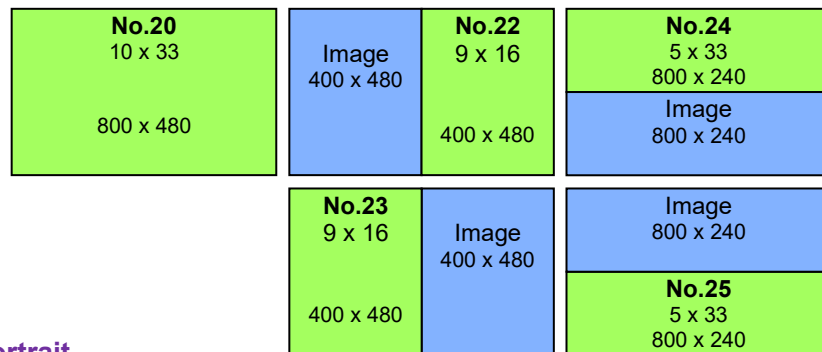
^{*1} To use the "Standard mode" functions, upgrade the firmware to [03.06A ESC / POS] or [03.06B ESC / POS] or later.

- Standard mode

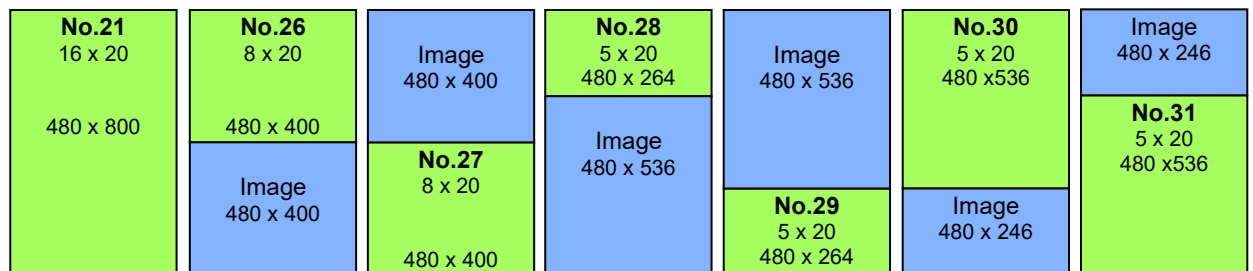
This setting can use all functions added in DM-D70

No	Rows, Columns	Direction	Screen structure
No.20	10rows, 33columns	Landscape	Full text
No.21	16rows, 20columns	Portrait	Full text
No.22	9rows, 16columns	Landscape	Left: Image, Right: Text
No.23	9rows, 16columns	Landscape	Left: Text, Right: Image
No.24	5rows, 33columns	Landscape	Upper: Text, Lower: Image
No.25	5rows, 33columns	Landscape	Upper: Image, Lower: Text
No.26	8rows, 20columns	Portrait	Upper: Text, Lower: Image
No.27	8rows, 20columns	Portrait	Upper: Image, Lower: Text
No.28	5rows, 20columns	Portrait	Upper: Text (1/3), Lower: Image (2/3)
No.29	5rows, 20columns	Portrait	Upper: Image (2/3), Lower: Text (1/3)
No.30	11rows, 20columns	Portrait	Upper: Text (2/3), Lower: Image (1/3)
No.31	11rows 20columns	Portrait	Upper: Image (1/3), Lower: Text (2/3)

DM-D70: Landscape



DM-D70: Portrait



- Fixed row and column mode

It is a setting that is conscious of the compatible layout of DM-D110/ DM-D210/ DM-D30/ DM-D500.

No	Rows, Columns	Direction	Screen structure
No.1	2rows, 20columns	Landscape	Upper: Text, Lower: Image
No.2			Upper: Image, Lower: Text
No.3			Center: Text
No.4	4rows, 32columns		Upper: Text, Lower: Image
No.5			Upper: Image, Lower: Text
No.6			Center: Text
No.7	8rows, 42columns		Upper: Text, Lower: Image
No.8			Upper: Image, Lower: Text
No.9			Center: Text
No.10	3rows, 32columns		Upper: Text, Lower: Image
No.11			Upper: Image, Lower: Text
No.12			Center: Text
No.13	2rows, 32columns		Upper: Text, Lower: Image
No.14			Upper: Image, Lower: Text
No.15			Center: Text

DM-D70: Landscape

No.1 2 x 20 800 x 240	No.4 4 x 32 800 x 240	No.7 8 x 42 800 x 240	No.10 3 x 32 800 x 240	No.13 2 x 32 800 x 240
Image 800 x 240	Image 800 x 240	Image 800 x 240	Image 800 x 240	Image 800 x 240
Image 800 x 240	Image 800 x 240	Image 800 x 240	Image 800 x 240	Image 800 x 240
No.2 2 x 20 800 x 240	No.5 4 x 32 800 x 240	No.8 8 x 42 800 x 240	No.11 3 x 32 800 x 240	No.14 2 x 32 800 x 240
No.3 2 x 20	No.6 4 x 32	No.9 8 x 42	No.12 3 x 32	No.15 2 x 32

Note: The grayed-out part cannot be displayed.

3.3.2 Conditions for Execution of CheckHealth Method

The conditions for execution of the CheckHealth method are as follows for the marquee and teletype. The 1 to 3 levels of the CheckHealth method are common.

- All windows should show MarqueeType=DISP_MT_NONE and all windows should be set to InterCharacterWait=0.

If these conditions are not met, OPOS_E_BUSY is returned.

3.3.3 Marquee Operation details

If the ReleaseDevice method is executed while the marquee is activated, the display will stop at that point. When the ClaimDevice method is then executed, the display will continue as it is. If DeviceEnabled property is set to TRUE, marquee will start working again.

Modify the MarqueeType property in the disable condition or after executing the ReleaseDevice method. Then, the display will take place in accordance with the modified MarqueeType property when the ClaimDevice method is executed and the DeviceEnabled property is set to TRUE.

3.3.4 Teletype Display Outside the Viewport

Only the characters displayed inside the viewport are teletyped. In the logical window, the data outside the viewport are processed instantly, not in accordance with the specified interval set as InterCharacterWait.

Ex.1: Window with large width

The viewport is defined as a 2×5 window and the window as a 2×8 window. "1234567890123" is displayed herein by Teletype display. The InterCharacterWait property is set to 1000 msec.

One character is shown at a time inside the viewport during the first 5 seconds.

1	2	3	4	5			

Then, processing to "8" is executed instantly without waiting for the interval set as the InterCharacterWait time

1	2	3	4	5	6	7	8

After the following one-second has elapsed, display takes place from '9'.

1	2	3	4	5	6	7	8
9							

When comma is used as the time delimiter, it will be displayed as "1, 2, 3, 4, 5, 9, 0, 1, 2, 3".

Ex.2: Window with large height

The viewport is defined as a 2×3 window and the window as a 4×3 window. "1234567890" is displayed herein by Teletype display. The InterCharacterWait property is set to 1000 msec.

One character is shown at a time inside the viewport during the first 6 seconds.

1	2	3
4	5	6

After that, the display position changes instantly without waiting for the interval

set as the InterCharacterWait time.

1	2	3
4	5	6
7	8	9
0	1	2

3

However, since the data is longer than the window, scrolling occurs.

4	5	6
7	8	9

At this point, the “789”, newly displayed inside the viewport by scrolling, is displayed by teletype. It will be displayed as “1, 2, 3, 4, 5, 6, 7, 8, 9” (when comma is used as the time delimiter).

3.3.5 ClearText Method during Teletyped Display

When the ClearText method is executed in the Teletype Mode, the data which has been buffered and still has not been displayed is also deleted.

Section 4. Expanded Functions

This section describes those of the expanded functions of the LineDisplay.

4.1 DirectIO Function

Describes the specifications of the DirectIO method and DirectIOEvent.

The defined commands are described below.

Command	details
DISP_DI_OUTPUT	Output the data specified in "pString".
DISP_DI_LAYOUT	Setting layout.
DISP_DI_ROW_COLUMN	Setting rows and columns.
DISP_DI_DISPLAY_BACKGROUND_COLOR	Setting background color.
DISP_DI_SLIDESHOW	Setting slide show.
DISP_DI_SET_TEXT_COLOR	Setting text color.
DISP_DI_SET_BARCODE_DATA	Register barcode data.
DISP_DI_DISPLAY_BARCODE	Display barcode.
DISP_DI_CLEAR_BARCODE	Clear displayed barcode.
DISP_DI_REGISTER_IMAGE	Register download image.
DISP_DI_DISPLAY_IMAGE	Display download image.
DISP_DI_DISPLAY_NV_IMAGE	Display NV image.
DISP_DI_CLEAR_IMAGE	Clear displayed image.
DISP_DI_SET_FONT	Set the first priority font.
DISP_DI_GET_FONT	Get the setting font.

The supported functions and combinations with the "Display mode" are as follows.

Command	Standard mode	Fixed row and column mode
DISP_DI_OUTPUT	○	○
DISP_DI_LAYOUT	○	×
DISP_DI_ROW_COLUMN	○	×
DISP_DI_DISPLAY_BACKGROUND_COLOR	○	×
DISP_DI_SLIDESHOW	○	×
DISP_DI_SET_TEXT_COLOR	○	×
DISP_DI_SET_BARCODE_DATA	○	×
DISP_DI_DISPLAY_BARCODE	○	×
DISP_DI_CLEAR_BARCODE	○	×
DISP_DI_REGISTER_IMAGE	○	×
DISP_DI_DISPLAY_IMAGE	○	×
DISP_DI_DISPLAY_NV_IMAGE	○	×
DISP_DI_CLEAR_IMAGE	○	×
DISP_DI_SET_FONT	○	×
DISP_DI_GET_FONT	○	×

○:Support ×:Not support

4.1.1 DISP_DI_OUTPUT

Parameter	Command	DISP_DI_OUTPUT ^{*1}
	<i>pData</i>	Not used
	<i>pString</i>	Output data
Description	<p>The data specified by pString is sent.</p> <p>If you send to the display, you need to put the display selection command (ESC = 2) in front of the data.</p> <p>ServiceObject does not parse the specified data.</p> <p>Therefore, it is necessary to fully understand and use the ESC / POS command and EPSON TM series specifications.</p> <p>If you send a command that interferes with the operation of the ServiceObject, we cannot guarantee its operation.</p>	
Return value	ResultCode	Meaning
	OPOS_E_CLOSED	The Service is not open.
	OPOS_E_NOTCLAIMED	The exclusive access right was not acquired.
	OPOS_E_DISABLED	Disable state.
	OPOS_E_ILLEGAL	Could not complete processing.
	OPOS_E_FAILURE	There is a problem with the device.
	OPOS_E_OFFLINE	Device is offline.

4.1.2 DISP_DI_LAYOUT

Parameter	Command	DISP_DI_LAYOUT
	<i>pData</i>	Layout number
	<i>pString</i>	Not used
Description	<p>Select a layout. Destroy all windows if they have been created.</p> <p><small>Note:</small> Not available when the layout is in fixed row column mode.</p>	
Return value	ResultCode	Meaning
	OPOS_E_CLOSED	The Service is not open.
	OPOS_E_NOTCLAIMED	The exclusive access right was not acquired.
	OPOS_E_DISABLED	Disable state.
	OPOS_E_ILLEGAL	Layout number is out of range.
		OPOS_EX_BADPARAM + 2
		"Fixed row and column mode" layout is selected. OPOS_EX_INVALIDMODE
	OPOS_E_FAILURE	There is a problem with the device.

4.1.3 DISP_DI_ROW_COLUMN

Parameter	Command	DISP_DI_ROW_COLUMN
	<i>pData</i>	Not used
	<i>pString</i>	Specify the number of lines and digits as a comma-separated character string. ex: "2,20"
Description	Specify the number of lines and columns. Destroy all windows if they have been created. The maximum number of lines and digits depends on the layout number. <small>Note:</small> Not available when the layout is in fixed row column mode.	
Return value	ResultCode	Meaning
	OPOS_E_CLOSED	The Service is not open.
	OPOS_E_NOTCLAIMED	The exclusive access right was not acquired.
	OPOS_E_DISABLED	Disable state.
	OPOS_E_ILLEGAL	"Fixed row and column mode" layout is selected. OPOS_EX_INVALIDMODE
		Row value is out of range. OPOS_EX_BADPARAM + 2
		Column value is out of range OPOS_EX_BADPARAM + 2
	OPOS_E_FAILURE	There is a problem with the device.

Layout number	Maximum row	Maximum column	Valid combinations
No.20	13	44	row:1, $4 \leq \text{column} \leq 44$ row:2, $7 \leq \text{column} \leq 44$ row:3, $10 \leq \text{column} \leq 44$ row:4, $14 \leq \text{column} \leq 44$ row:5, $17 \leq \text{column} \leq 44$ row:6, $20 \leq \text{column} \leq 44$ row:7, $23 \leq \text{column} \leq 44$ row:8, $26 \leq \text{column} \leq 44$ row:9, $30 \leq \text{column} \leq 44$ row:10, $33 \leq \text{column} \leq 44$ row:11, $37 \leq \text{column} \leq 44$ row:12, $39 \leq \text{column} \leq 44$ row:13, $43 \leq \text{column} \leq 44$
No.21	19	22	row: 1, $2 \leq \text{column} \leq 22$ row: 2, $3 \leq \text{column} \leq 22$ row: 3, $4 \leq \text{column} \leq 22$ row: 4, $5 \leq \text{column} \leq 22$ row: 5, $6 \leq \text{column} \leq 22$ row: 6, $8 \leq \text{column} \leq 22$ row: 7, $9 \leq \text{column} \leq 22$ row: 8, $10 \leq \text{column} \leq 22$ row: 9, $11 \leq \text{column} \leq 22$ row: 10, $12 \leq \text{column} \leq 22$ row: 11, $13 \leq \text{column} \leq 22$ row: 12, $15 \leq \text{column} \leq 22$ row: 13, $16 \leq \text{column} \leq 22$ row: 14, $17 \leq \text{column} \leq 22$ row: 15, $18 \leq \text{column} \leq 22$ row: 16, $19 \leq \text{column} \leq 22$ row: 17, $21 \leq \text{column} \leq 22$ row: 18, $21 \leq \text{column} \leq 22$ row: 19, $22 \leq \text{column} \leq 22$

No.22	13	22	row: 1, 2 ≤ column ≤ 22 row: 2, 4 ≤ column ≤ 22 row: 3, 5 ≤ column ≤ 22 row: 4, 7 ≤ column ≤ 22 row: 5, 9 ≤ column ≤ 22 row: 6, 10 ≤ column ≤ 22 row: 7, 12 ≤ column ≤ 22 row: 8, 13 ≤ column ≤ 22 row: 9, 15 ≤ column ≤ 22 row: 10, 17 ≤ column ≤ 22 row: 11, 19 ≤ column ≤ 22 row: 12, 20 ≤ column ≤ 22 row: 13, 22 ≤ column ≤ 22
No.23	13	22	row: 1, 2 ≤ column ≤ 22 row: 2, 4 ≤ column ≤ 22 row: 3, 5 ≤ column ≤ 22 row: 4, 7 ≤ column ≤ 22 row: 5, 9 ≤ column ≤ 22 row: 6, 10 ≤ column ≤ 22 row: 7, 12 ≤ column ≤ 22 row: 8, 13 ≤ column ≤ 22 row: 9, 15 ≤ column ≤ 22 row: 10, 17 ≤ column ≤ 22 row: 11, 19 ≤ column ≤ 22 row: 12, 20 ≤ column ≤ 22 row: 13, 22 ≤ column ≤ 22
No.24	6	44	row: 1, 7 ≤ column ≤ 44 row: 2, 14 ≤ column ≤ 44 row: 3, 20 ≤ column ≤ 44 row: 4, 26 ≤ column ≤ 44 row: 5, 33 ≤ column ≤ 44 row: 6, 39 ≤ column ≤ 44
No.25	6	44	row: 1, 7 ≤ column ≤ 44 row: 2, 14 ≤ column ≤ 44 row: 3, 20 ≤ column ≤ 44 row: 4, 26 ≤ column ≤ 44 row: 5, 33 ≤ column ≤ 44 row: 6, 39 ≤ column ≤ 44
No.26	9	22	row: 1, 3 ≤ column ≤ 22 row: 2, 5 ≤ column ≤ 22 row: 3, 8 ≤ column ≤ 22 row: 4, 10 ≤ column ≤ 22 row: 5, 12 ≤ column ≤ 22 row: 6, 15 ≤ column ≤ 22 row: 7, 17 ≤ column ≤ 22 row: 8, 19 ≤ column ≤ 22 row: 9, 21 ≤ column ≤ 22
No.27	9	22	row: 1, 3 ≤ column ≤ 22 row: 2, 5 ≤ column ≤ 22 row: 3, 8 ≤ column ≤ 22 row: 4, 10 ≤ column ≤ 22 row: 5, 12 ≤ column ≤ 22 row: 6, 15 ≤ column ≤ 22 row: 7, 17 ≤ column ≤ 22 row: 8, 19 ≤ column ≤ 22

			row: 9, 21 ≤ column ≤ 22
No.28	6	22	row: 1, 4 ≤ column ≤ 22 row: 2, 8 ≤ column ≤ 22 row: 3, 11 ≤ column ≤ 22 row: 4, 15 ≤ column ≤ 22 row: 5, 18 ≤ column ≤ 22 row: 6, 21 ≤ column ≤ 22
No.29	6	22	row: 1, 4 ≤ column ≤ 22 row: 2, 8 ≤ column ≤ 22 row: 3, 11 ≤ column ≤ 22 row: 4, 15 ≤ column ≤ 22 row: 5, 18 ≤ column ≤ 22 row: 6, 21 ≤ column ≤ 22
No.30	12	22	row: 1, 2 ≤ column ≤ 22 row: 2, 4 ≤ column ≤ 22 row: 3, 6 ≤ column ≤ 22 row: 4, 8 ≤ column ≤ 22 row: 5, 9 ≤ column ≤ 22 row: 6, 11 ≤ column ≤ 22 row: 7, 13 ≤ column ≤ 22 row: 8, 15 ≤ column ≤ 22 row: 9, 17 ≤ column ≤ 22 row: 10, 18 ≤ column ≤ 22 row: 11, 20 ≤ column ≤ 22 row: 12, 21 ≤ column ≤ 22
No.31	12	22	row: 1, 2 ≤ column ≤ 22 row: 2, 4 ≤ column ≤ 22 row: 3, 6 ≤ column ≤ 22 row: 4, 8 ≤ column ≤ 22 row: 5, 9 ≤ column ≤ 22 row: 6, 11 ≤ column ≤ 22 row: 7, 13 ≤ column ≤ 22 row: 8, 15 ≤ column ≤ 22 row: 9, 17 ≤ column ≤ 22 row: 10, 18 ≤ column ≤ 22 row: 11, 20 ≤ column ≤ 22 row: 12, 21 ≤ column ≤ 22

4.1.4 DISP_DI_DISPLAY_BACKGROUND_COLOR

Parameter	Command	DISP_DI_DISPLAY_BACKGROUND_COLOR
	<i>pData</i>	Background color <ul style="list-style-type: none"> 24bit RGB888 format. CSS3 extended color.
	<i>pString</i>	Target line “odd”: Odd lines. “even”: Even lines. Empty string (“”): All lines. Comma separated numbers: line numbers.
Description	Specifies the background color of the text area. Note: Not available when the layout is in fixed row column mode.	
Return value	ResultCode	Meaning
	OPOS_E_CLOSED	The Service is not open.
	OPOS_E_NOTCLAIMED	The exclusive access right was not acquired.
	OPOS_E_DISABLED	Disable state.
	OPOS_E_ILLEGAL	Background color value is out of range. OPOS_EX_BADPARAM + 2
		“Fixed row and column mode” layout is selected. OPOS_EX_INVALIDMODE
	OPOS_E_FAILURE	There is a problem with the device.

Constant	Meaning
DISP_DI_BLACK	Black
DISP_DI_NAVY	Navy
DISP_DI_DARKBLUE	DarkBlue
DISP_DI_MEDIUMBLUE	MediumBlue
DISP_DI_BLUE	Blue
DISP_DI_DARKGREEN	DarkGreen
DISP_DI_GREEN	Green
DISP_DI_TEAL	Teal
DISP_DI_DARKCYAN	DarkCyan
DISP_DI_DEEPSKYBLUE	DeepSkyBlue
DISP_DI_DARKTURQUOISE	DarkTurquoise
DISP_DI_MEDIUMSPRINGGREEN	MediumSpringGreen
DISP_DI_LIME	Lime
DISP_DI_SPRINGGREEN	SpringGreen
DISP_DI_AQUA	Aqua
DISP_DI_CYAN	Cyan
DISP_DI_MIDNIGHTBLUE	MidnightBlue
DISP_DI_DODGERBLUE	DodgerBlue
DISP_DI_LIGHTSEAGREEN	LightSeaGreen
DISP_DI_FORESTGREEN	ForestGreen
DISP_DI_SEAGREEN	SeaGreen
DISP_DI_DARKSLATEGRAY	DarkSlateGray
DISP_DI_DARKSLATEGREY	DarkSlateGrey
DISP_DI_LIMEGREEN	LimeGreen
DISP_DI_MEDIUMSEAGREEN	MediumSeaGreen
DISP_DI_TURQUOISE	Turquoise
DISP_DI_ROYALBLUE	RoyalBlue
DISP_DI_STEELBLUE	SteelBlue
DISP_DI_DARKSLATEBLUE	DarkSlateBlue
DISP_DI_MEDIUMTURQUOISE	MediumTurquoise
DISP_DI_INDIGO	Indigo
DISP_DI_DARKOLIVEGREEN	DarkOliveGreen
DISP_DI_CADETBLUE	CadetBlue
DISP_DI_CORNFLOWERBLUE	CornflowerBlue

DISP_DI_MEDIUMAQUAMARINE	MediumAquaMarine
DISP_DI_DIMGRAY	DimGray
DISP_DI_DIMGREY	DimGrey
DISP_DI_SLATEBLUE	SlateBlue
DISP_DI_OLIVEDRAB	OliveDrab
DISP_DI_SLATEGRAY	SlateGray
DISP_DI_SLATEGREY	SlateGrey
DISP_DI_LIGHTSLATEGRAY	LightSlateGray
DISP_DI_LIGHTSLATEGREY	LightSlateGrey
DISP_DI_MEDIUMSLATEBLUE	MediumSlateBlue
DISP_DI_LAWNGREEN	LawnGreen
DISP_DI_CHARTREUSE	Chartreuse
DISP_DI_AQUAMARINE	Aquamarine
DISP_DI_MAROON	Maroon
DISP_DI_PURPLE	Purple
DISP_DI_OLIVE	Olive
DISP_DI_GRAY	Gray
DISP_DI_GREY	Grey
DISP_DI_SKYBLUE	SkyBlue
DISP_DI_LIGHTSKYBLUE	LightSkyBlue
DISP_DI_BLUEVIOLET	BlueViolet
DISP_DI_DARKRED	DarkRed
DISP_DI_DARKMAGENTA	DarkMagenta
DISP_DI_SADDLEBROWN	SaddleBrown
DISP_DI_DARKSEAGREEN	DarkSeaGreen
DISP_DI_LIGHTGREEN	LightGreen
DISP_DI_MEDIUMPURPLE	MediumPurple
DISP_DI_DARKVIOLET	DarkViolet
DISP_DI_PALEGREEN	PaleGreen
DISP_DI_DARKORCHID	DarkOrchid
DISP_DI_YELLOWGREEN	YellowGreen
DISP_DI_SIENNA	Sienna
DISP_DI_BROWN	Brown
DISP_DI_DARKGRAY	DarkGray
DISP_DI_DARKGREY	DarkGrey
DISP_DI_LIGHTBLUE	LightBlue
DISP_DI_GREENYELLOW	GreenYellow
DISP_DI_PALETURQUOISE	PaleTurquoise
DISP_DI_LIGHTSTEELBLUE	LightSteelBlue
DISP_DI_POWDERBLUE	PowderBlue
DISP_DI_FIREBRICK	FireBrick
DISP_DI_DARKGOLDENROD	DarkGoldenRod
DISP_DI_MEDIUMORCHID	MediumOrchid
DISP_DI_ROSYBROWN	RosyBrown
DISP_DI_DARKKHAKI	DarkKhaki
DISP_DI_SILVER	Silver
DISP_DI_MEDIUMVIOLETRED	MediumVioletRed
DISP_DI_INDIANRED	IndianRed
DISP_DI_PERU	Peru
DISP_DI_CHOCOLATE	Chocolate
DISP_DI_TAN	Tan
DISP_DI_LIGHTGRAY	LightGray
DISP_DI_LIGHTGREY	LightGrey
DISP_DI_PALEVIOLETRED	PaleVioletRed
DISP_DI_THISTLE	Thistle
DISP_DI_ORCHID	Orchid
DISP_DI_GOLDENROD	GoldenRod
DISP_DI_CRIMSON	Crimson
DISP_DI_GAINSBORO	Gainsboro
DISP_DI_PLUM	Plum

DISP DI BURLYWOOD	BurlyWood
DISP DI LIGHTCYAN	LightCyan
DISP DI LAVENDER	Lavender
DISP DI DARKSALMON	DarkSalmon
DISP DI VIOLET	Violet
DISP DI PALEGOLDENROD	PaleGoldenRod
DISP DI LIGHTCORAL	LightCoral
DISP DI KHAKI	Khaki
DISP DI ALICEBLUE	AliceBlue
DISP DI HONEYDEW	HoneyDew
DISP DI AZURE	Azure
DISP DI SANDYBROWN	SandyBrown
DISP DI WHEAT	Wheat
DISP DI BEIGE	Beige
DISP DI WHITESMOKE	WhiteSmoke
DISP DI MINTCREAM	MintCream
DISP DI GHOSTWHITE	GhostWhite
DISP DI SALMON	Salmon
DISP DI ANTIQUEWHITE	AntiqueWhite
DISP DI LINEN	Linen
DISP DI LIGHTGOLDENRODYELLOW	LightGoldenRodYellow
DISP DI OLDLACE	OldLace
DISP DI RED	Red
DISP DI FUCHSIA	Fuchsia
DISP DI MAGENTA	Magenta
DISP DI DEEPPINK	DeepPink
DISP DI ORANGERED	OrangeRed
DISP DI TOMATO	Tomato
DISP DI HOTPINK	HotPink
DISP DI CORAL	Coral
DISP DI DARKORANGE	Darkorange
DISP DI LIGHTSALMON	LightSalmon
DISP DI ORANGE	Orange
DISP DI LIGHTPINK	LightPink
DISP DI PINK	Pink
DISP DI GOLD	Gold
DISP DI PEACHPUFF	PeachPuff
DISP DI NAVAJOWHITE	NavajoWhite
DISP DI MOCCASIN	Moccasin
DISP DI BISQUE	Bisque
DISP DI MISTYROSE	MistyRose
DISP DI BLANCHEDALMOND	BlanchedAlmond
DISP DI PAPAYAWHIP	PapayaWhip
DISP DI LAVENDERBLUSH	LavenderBlush
DISP DI SEASHELL	SeaShell
DISP DI CORNSILK	Cornsilk
DISP DI LEMONCHIFFON	LemonChiffon
DISP DI FLORALWHITE	FloralWhite
DISP DI SNOW	Snow
DISP DI YELLOW	Yellow
DISP DI LIGHTYELLOW	LightYellow
DISP DI IVORY	Ivory
DISP DI WHITE	White

4.1.5 DISP_DI_SLIDESHOW

Parameter	Command	DISP_DI_SLIDESHOW
	<i>pData</i>	DISP_DI_SLIDESHOW_START DISP_DI_SLIDESHOW_STOP
	<i>pString</i>	Not used
Description	Start or stop the slide show. <small>Note1:</small> Not available when the layout is in fixed row column mode. <small>Note2:</small> This feature requires the utility to pre-register the image.	
Return value	ResultCode	Meaning
	OPOS_E_CLOSED	The Service is not open.
	OPOS_E_NOTCLAIMED	The exclusive access right was not acquired.
	OPOS_E_DISABLED	Disable state.
	OPOS_E_ILLEGAL	"pData" value is illegal. OPOS_EX_BADPARAM + 2 "Fixed row and column mode" layout is selected. OPOS_EX_INVALIDMODE
	OPOS_E_FAILURE	There is a problem with the device.

4.1.6 DISP_DI_SET_TEXT_COLOR

Parameter	Command	DISP_DI_SET_TEXT_COLOR
	<i>pData</i>	Text color • 24bit RGB888 format. • CSS3 extended color. *1
	<i>pString</i>	Not used
Description	Set the text color. If you specify the text color, the text color to be output after that is displayed in the specified color. <small>Note:</small> Not available when the layout is in fixed row column mode.	
Return value	ResultCode	Meaning
	OPOS_E_CLOSED	The Service is not open.
	OPOS_E_NOTCLAIMED	The exclusive access right was not acquired.
	OPOS_E_DISABLED	Disable state.
	OPOS_E_ILLEGAL	"Fixed row and column mode" layout is selected. OPOS_EX_INVALIDMODE
	OPOS_E_FAILURE	There is a problem with the device.

*1 Refer to the definition of [DISP_DI_DISPLAY_BACKGROUND_COLOR].

4.1.7 DISP_DI_SET_BARCODE_DATA

Parameter	Command	DISP_DI_SET_BARCODE_DATA
	<i>pData</i>	Barcode type: DISP_DI_QRCODE_MODEL_1: QR code model1 DISP_DI_QRCODE_MODEL_2: QR code model2
	<i>pString</i>	Barcode data.
Description	Register the barcode data. <small>Note1:</small> Not available when the layout is in fixed row column mode. <small>Note2:</small> The error correction level is fixed at 7%. A quiet zone is added.	
Return value	ResultCode	Meaning
	OPOS_E_CLOSED	The Service is not open.
	OPOS_E_NOTCLAIMED	The exclusive access right was not acquired.
	OPOS_E_DISABLED	Disable state.
	OPOS_E_ILLEGAL	"pData" value is illegal. OPOS_EX_BADPARAM + 2 "Fixed row and column mode" layout is selected. OPOS_EX_INVALIDMODE
	OPOS_E_FAILURE	There is a problem with the device.

4.1.8 DISP_DI_DISPLAY_BARCODE

Parameter	Command	DISP_DI_DISPLAY_BARCODE
	<i>pData</i>	Barcode type: DISP_DI_QRCODE_MODEL_1: QR code model1 DISP_DI_QRCODE_MODEL_2: QR code model2
	<i>pString</i>	Specify the display X position, display Y position, and size as a comma-separated string. Landscape: X position: 0 to 799, Y position: 0 to 479 Portrait: X position: 0 to 479, Y position: 0 to 799 Size: 1 ~ 16 ex: "0,0,5"
Description	Display the registered barcode. Note1: The maximum value of the display X position and Y position differs depending on the layout number. Note2: Not available when the layout is in fixed row column mode.	
Return value	ResultCode	Meaning
	OPOS_E_CLOSED	The Service is not open.
	OPOS_E_NOTCLAIMED	The exclusive access right was not acquired.
	OPOS_E_DISABLED	Disable state.
	OPOS_E_ILLEGAL	"pData" value is illegal.
		OPOS_EX_BADPARAM + 2
		Barcode data is not registered.
		OPOS_EX_BADPARAM + 3
		X position value is out of range.
		OPOS_EX_BADPARAM + 3
		Y position value is out of range.
		OPOS_EX_BADPARAM + 3
		"Size" value is out of range
		OPOS_EX_BADPARAM + 3
		"Fixed row and column mode" layout is selected.
		OPOS_EX_INVALIDMODE
	OPOS_E_FAILURE	There is a problem with the device.

4.1.9 DISP_DI_CLEAR_BARCODE

Parameter	Command	DISP_DI_CLEAR_BARCODE
	<i>pData</i>	Not used
	<i>pString</i>	Not used
Description	Clear the displayed barcode. Note: Not available when the layout is in fixed row column mode.	
Return value	ResultCode	Meaning
	OPOS_E_CLOSED	The Service is not open.
	OPOS_E_NOTCLAIMED	The exclusive access right was not acquired.
	OPOS_E_DISABLED	Disable state.
	OPOS_E_ILLEGAL	"Fixed row and column mode" layout is selected.
	OPOS_EX_INVALIDMODE	
	OPOS_E_FAILURE	There is a problem with the device.

4.1.10 DISP_DI_REGISTER_IMAGE

Parameter	Command	DISP_DI_REGISTER_IMAGE
	<i>pData</i>	Image registration number. (Range:1~255)
	<i>pString</i>	Image file name.
Description	<p>Register the download image.</p> <p>If you register multiple images, you must to change the registration number. At that time, specify consecutive numbers without skipping the numbers.</p> <p>For example, you cannot register to number 3 after registering to number 1. Please register at number 2 after number 1.</p> <p>Up to 255 images can be registered. However, if the total size of the registered files exceeds 1.5 Mbytes, it cannot be registered.</p> <p>Not available when the layout is in fixed row column mode.</p> <p>Note1: The display supports PNG and JPEG formats. The OPOS driver does not validate the image format. If no error occurs and the image cannot be displayed, check the image data format.</p> <p>Note2: When using a JPEG format image, use an image with a Width value of 2 or more. Also, if you specify an image that exceeds the maximum value of the device, it will be cropped to the device size and displayed.</p> <p>Note3: If this DirectIO is executed due to poor communication, but the return value is not returned, immediately execute the Close method and re-initialize the LineDisplay.</p> <p>Note4: This API converts the image format and the number of pixels in order to fit the specification before registering it to the customer display.</p> <p>Therefore, the image size may increase due to the conversion process, please consider a margin for the total size of the images to be registered. Even if registration cannot be performed due to insufficient free space in the download graphics memory, an error cannot be detected.</p>	
Return value	ResultCode	Meaning
	OPOS_E_CLOSED	The Service is not open.
	OPOS_E_NOTCLAIMED	The exclusive access right was not acquired.
	OPOS_E_DISABLED	Disable state.
	OPOS_E_ILLEGAL	Registration number is out of range.
		OPOS_EX_BADPARAM + 2
		"Fixed row and column mode" layout is selected.
	OPOS_E_NOEXIST	OPOS_EX_INVALIDMODE
		Registration numbers are not consecutive.
	OPOS_E_EXTENDED	OPOS_EX_BADPARAM + 2
	OPOS_E_NOEXIST	The file specified by "pString" cannot be opened.
	OPOS_E_EXTENDED	The size of the file specified by "pString" is 0.
	OPOS_E_FAILURE	OPOS_EDISP_BADFORMAT
		There is a problem with the device.

4.1.11 DISP_DI_DISPLAY_IMAGE

Parameter	Command	DISP_DI_DISPLAY_IMAGE
	<i>pData</i>	Registered image number. Range:1~255
	<i>pString</i>	Specify the X position, Y position, width W, and height H of the image to be displayed separated by commas. Landscap e X position: 0~799, Y position: 0~479 Portrait X position: 0~479, Y position: 0~799 W: 0~1440 H: 0~1440 ex: "100,100,0,0"
Description	The image is displayed at the specified position. The maximum value of the display X position and Y position differs depending on the layout number. <small>Note: Not available when the layout is in fixed row column mode.</small>	
Return value	ResultCode	Meaning
	OPOS_E_CLOSED	The Service is not open.
	OPOS_E_NOTCLAIMED	The exclusive access right was not acquired.
	OPOS_E_DISABLED	Disable state.
	OPOS_E_ILLEGAL	Registration number is out of range. OPOS_EX_BADPARAM + 2
		The image is not registered in the registered number. OPOS_EX_BADPARAM + 3
		X position is out of range. OPOS_EX_BADPARAM + 3
		Y position is out of range OPOS_EX_BADPARAM + 3
		W parameter is out of range OPOS_EX_BADPARAM + 3
		H parameter is out of range OPOS_EX_BADPARAM + 3
		"Fixed row and column mode" layout is selected. OPOS_EX_INVALIDMODE
	OPOS_E_FAILURE	There is a problem with the device.

4.1.12 DISP_DI_DISPLAY_NV_IMAGE

Parameter	Command	DISP_DI_DISPLAY_NV_IMAGE
	<i>pData</i>	Not used
	<i>pString</i>	Specify two key codes, X position, Y position, width W, and height H of the image to be displayed, separated by commas. Key code: $65 \leq k \leq 90$, $97 \leq k \leq 122$ Landscape: X position: 0~799, Y position: 0~479 Portrait: X position: 0~479, Y position: 0~799 W: 0~1440 H: 0~1440
Description	The NV image is displayed at the specified position. The maximum value of the display X position and Y position differs depending on the layout number. <small>Note1:</small> Not available when the layout is in fixed row column mode. <small>Note2:</small> Use the display utility to register NV images.	
Return value	ResultCode	Meaning
	OPOS_E_CLOSED	The Service is not open.
	OPOS_E_NOTCLAIMED	The exclusive access right was not acquired.
	OPOS_E_DISABLED	Disable state.
	OPOS_E_ILLEGAL	Specified key code is out of range. OPOS_EX_BADPARAM + 3
		X position is out of range. OPOS_EX_BADPARAM + 3
		Y position is out of range OPOS_EX_BADPARAM + 3
		W parameter is out of range OPOS_EX_BADPARAM + 3
		H parameter is out of range OPOS_EX_BADPARAM + 3
		"Fixed row and column mode" layout is selected. OPOS_EX_INVALIDMODE
	OPOS_E_FAILURE	There is a problem with the device.

4.1.13 DISP_DI_CLEAR_IMAGE

Parameter	Command	DISP_DI_CLEAR_IMAGE
	<i>pData</i>	Not used
	<i>pString</i>	Not used
Description	Clear the image displayed in the image area. <small>Note:</small> Not available when the layout is in fixed row column mode.	
Return value	ResultCode	Meaning
	OPOS_E_CLOSED	The Service is not open.
	OPOS_E_NOTCLAIMED	The exclusive access right was not acquired.
	OPOS_E_DISABLED	Disable state.
	OPOS_E_ILLEGAL	"Fixed row and column mode" layout is selected. OPOS_EX_INVALIDMODE
	OPOS_E_FAILURE	There is a problem with the device.

4.1.14 DISP_DI_SET_FONT

Parameter	Command	DISP_DI_SET_FONT
	<i>pData</i>	Specify the font to be displayed preferentially. DISP_DI_FONT_ANK (0): Alphanumeric font. DISP_DI_FONT_JP (11): Japanese font. DISP_DI_FONT_SC (21): Simplified Chinese font. DISP_DI_FONT_TC (31): Traditional Chinese font. DISP_DI_FONT_KO (41): Korean font.
	<i>pString</i>	Not used
Description	Set the type of font to be displayed. The specified font is set as the first priority, and the first priority font before designation is set as the second priority font.	
Return value	ResultCode	Meaning
	OPOS_E_CLOSED	The Service is not open.
	OPOS_E_NOTCLAIMED	The exclusive access right was not acquired.
	OPOS_E_DISABLED	Disable state.
	OPOS_E_ILLEGAL	Specified font value is out of range. OPOS_EX_BADPARAM + 2
	OPOS_E_FAILURE	There is a problem with the device.

4.1.15 DISP_DI_GET_FONT

Parameter	Command	DISP_DI_GET_FONT
	<i>pData</i>	Specify the priority number of the font to be acquired. Range: 1~5
	<i>pString</i>	Not used
Description	Gets the font set to the specified priority. After executing this function, one of the following corresponding to the specified priority number is set in "pData". DISP_DI_FONT_ANK (0): Alphanumeric font. DISP_DI_FONT_JP (11): Japanese font. DISP_DI_FONT_SC (21): Simplified Chinese font. DISP_DI_FONT_TC (31): Traditional Chinese font. DISP_DI_FONT_KO (41): Korean font.	
Return value	ResultCode	Meaning
	OPOS_E_CLOSED	The Service is not open.
	OPOS_E_NOTCLAIMED	The exclusive access right was not acquired.
	OPOS_E_DISABLED	Disable state.
	OPOS_E_ILLEGAL	Specified font value is out of range. OPOS_EX_BADPARAM + 2
	OPOS_E_FAILURE	There is a problem with the device.

4.2 DirectIOEvent Event

Not applicable

4.3 Escape Sequence List

The following figure is about supported/unsupported Escape Sequences.

Command	Meaning	Supported/Unsupported
ESC bC	The character strings following this command are highlighted.	X
ESC rvC	The character strings following this command are shown as reversed characters.	X
ESC N	Cancels the attributes of the set characters.	X

O :Supported

X :Unsupported

^{Note} In DM-D70, all escape sequences supported by LineDisplay in the past are no longer supported.

Section 5. Error Information

For error information when using LineDisplay properties and methods, see the LineDisplay item in the "Code List".

5.1 Remedial Actions for Principal Errors

ResultCodeExtended	Workaround
OPOS_EX_DEVBUSY, OPOS_EX_TIMEOUT	If the display is turned off, you need to close it and then Open/ Claim/ DeviceEnable=TRUE it again.
OPOS_EPTR_COVER_OPEN, OPOS_EPTR_JRN(REC)_EMPTY, OPOS_EPTR_CUTTER, OPOS_EPTR_UNRECOVERABLE, OPOS_EPTR_MECHANICAL, OPOS_EPTR_OVERHEAT OPOS_EX_PÖRTLOCKED	Check the status of the parent device Printer and execute the method and property again.
OPOS_EX_BADPARAM + x	The parameter for the method used is invalid. Check the parameter range of the method to be used.
OPOS_EX_INCAPABLE	Check the capabilities before changing to a program that executes the method.
OPOS_EX_BADPROPVAL	Please check the method and property specifications and the method and property setting conditions in this manual again through APG.
OPOS_EDISP_BADFORMAT	The image file formats that can be registered are JPG and PNG only. Do not specify any file format other than JPG and PNG. When specifying a JPG or PNG format file, please confirm the image file is not damaged.

Section 6. Warnings

- The total window area (viewport size) defined by CreateWindow cannot exceed one base window screen.
- If the window areas are overlapped and defined in CreateWindow, the overlapping lower area is not displayed. (Transparent display is not possible) At this time, even if the current window is switched, the overlapping lower windows do not exist on the top surface and are not displayed. Please switch using RefreshWindow.
- DestroyWindow is executed, the drawn contents of the discarded window will be deleted.
- The screen cannot be turned off even if specify 0 for the DeviceBrightness property. Brightness will be set 20%.
- When sending commands using DirectIO method, be sure to read description of the target command in the product manual.
- The port information should be in accordance with the settings of the parent device.
- When the DirectIO method is used to send data to the display, there may be data within the range from 128 to 255 that is not sent correctly. Accordingly, some data patterns of the downloaded characters cannot be specified.
- When the parent device is in the busy state (waiting for insertion of SLIP paper, or when cover is open, etc.), methods such as DisplayText will fail. Errors such as ResultCode=OPOS_E_ILLEGAL. ResultCodeExtended=Printer error details, etc. will be generated. Teletype display and Marquee display will not be updated while the printer is in the busy state.
- The settable baud rates and code pages differ with the device. Refer to the respective manuals.
- The DM series cannot automatically display period and comma characters using DirectIO.
- Depending on the operating environment, there can be a case of missing data when transmitting data via serial port. In order to prevent such cases of missing data, it is recommended to set a smaller value for the FIFO setting for the serial communication.
- If the ReadCharacterAtCursor method is executed when there is no character information at the cursor position, character code 127 is returned.
- The error code differs by that timing when the power is turned OFF.