EPSON OPOS ADK MANUAL

APPLICATION DEVELOPMENT GUIDE

LineDisplay
(DM-D110/ DM-D120/ DM-D210)

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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, see the Section 2 of this manual.

This manual applies to the following devices.

> DM-D110
> DM-D120[*1]
> DM-D210

> [*1] The operation is not supported in Windows Vista environment.

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 connection configurations and how to make the settings for the LineDisplay devices.

2.1 Device Information

The DeviceDescription and DeviceName for each model are as follows.

Model Name	I/F	DeviceDescription	DeviceName
DM-D110	S (Y)	EPSON DM-D110 (Y) LineDisplay	DM-D110
	S (Path)	EPSON DM-D110 (Path) LineDisplay	DM-D110
	U	EPSON DM-D110U LineDisplay	DM-D110U
DM-D120	S	EPSON DM-D120 LineDisplay	DM-D120
DM-D210	S (Y)	EPSON DM-D210 (Y) LineDisplay	DM-D210
	S (Path)	EPSON DM-D210 (Path) LineDisplay	DM-D210
	U	EPSON DM-D210U LineDisplay	DM-D210U

I/F indicate the connected interface.

The following is the list of the two connecting interfaces.

S: Serial

U: USB

In addition, there are Y-connection (Y) and pass-through connection (Path) in the Serial connection. When a device is stand-alone connected, use the pass-through connection.

2.2 References of Firmware Versions

Refer to the release notes (Relnote.txt).

2.3 Settings of DIP Switches and Hardware

Confirm that the following settings have been made correctly.

D110, D120, D210

No.	Setting	
1	OFF	Recommend
2	OFF	Settable
3	OFF	Settable
4	OFF	Settable
5	ON	Settable
6	OFF	Settable
7	ON	Settable
8	OFF	Recommended

Settings of DIP-switches become valid only after the power has been turned on.

- **For D110, D120, D210**

  Settings of 1 and 8 of DIP-SW1 can be changed, but it is recommended to set to OFF position.

  Set 2 to 7 of DIP-SW1 to match the port information. When using USB port, set 5, 6, 7 to OFF, OFF, ON, respectively.

The described set values are the default values. If these are changed, be sure to use the SetupPOS utility to change the port information.

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2.4 Setting of Devices

The SetupPOS utility should be used for setting devices. For more detail, refer to "EPSON OPOS ADK MANUAL User's Manual (Installer/ SetupPOS/ TMUSB)".

1) Setting of USB devices

When using a USB port, select devices with "U" appended to the end of the device name using the SetupPOS utility.

   DM-D110U/D210U

2) Device Specific Settings

Not applicable

2.5 Port Information

1) Port information when using serial port

The port information that can be set with the SetupPOS utility is as follows.

Setting Information	Effective Setting Range
Baud rate	2400, 4800, 9600, 19200, 38400, 57600, 115200
Bit length	7 bits, 8 bits
Parity	NONE, ODD, EVEN
Stop bit	1 bit
Handshake	DTR/DSR
Output buffer length	32~1024
Output interval time	0~9999

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The default settings are as shown in the following table.

Setting Information	Set value
Baud rate	9600
Bit length	8 bits
Parity	NONE
Stop bit	1 bit
Handshake	DTR/DSR
Output buffer length	1024
Output interval time	500

When a display is hydra-connected to a printer, all display settings are exactly the same as the connected printer. In the case of some printers, the output buffer length may not be compatible with the default of the display. In this case, the SetupPOS utility will display a warning when the hydra connection is made. In this event, press OK. This will make the display settings the same as the connected printer.

2) Port information when using parallel port
Not applicable

3) Port information when using USB port
The port information that can be set with the SetupPOS utility is limited to the output interval time. However, since the connection to the printer is a Y-connection, the output interval time setting is the same as that at of the connected printer.
Set the DIP-SW on the LineDisplay unit to 19200 bps.

4) Port information when using Ethernet port
Not applicable

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2.6 Connection Configuration

There are two ways to connect the EPSON DM series LineDisplay; i.e, as independent devices or as slave devices connected by hydra settings through a printer. However, when using a USB connection, only the hydra-connection that the device is connected to the printer's DM connector can be used. When using as an independent device, connect the display directly to the COM port on the PC or the IT(IR).

DM-D120 is designed to be connected via dedicated module and to be used standalone. When mounting it to IT(IR), connect it via dedicated module (on DM-D120) to the DM connector on the IT(IR).

When using as an independent device connected to the PC through a hydra connection, the method to connect the display depends on which display is being used. In the case of a display with the special RS-232C pass-through connection function (DM-D110, DM-D210), connect the display and the printer via the RS-232C port. In this case the display should be connected to the PC or the IT(IR).

If the device is a model which does not have the special modular pass-through connection function (DM-D110, DM-D210), both serial and USB connections can be used. Connect the printer and display by modular connections. In this case, the printer should be connected to the PC or IT(IR). The connection configurations with PC (IT, IR) are described below.

(1) Connecting a printer through a display

(path-through connection)

Host   Device   Device

PC   →   LineDisplay   →   POS Printer

(RS-232C)   (RS-232C)
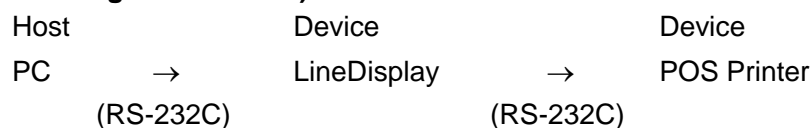
PC: COM1-COM10

LineDisplay: DM-D110/DM-D210

POS Printer: All printers with serial interface, except for the printer mounted on the EPSON IR.

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(2) Connecting a display through a printer using modular connector (PCs)
(Y Connection(Hydra Connection))

Host		Device		Device
PC	→	POS Printer	→	LineDisplay
(RS232C,USB)		(Modular)		
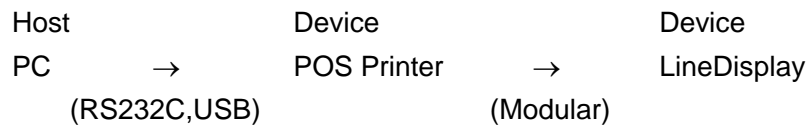
PC:　　　　COM1-COM10 (serial), USB1-USBx (the USB port number differs with the environment in which it is used. For details, refer to "EPSON OPOS ADK MANUAL User's Manual (Installer/ SetupPOS/ TMUSB)".)

LineDisplay:　DM-D110, DM-D210
　　　　　　DM-D110U, DM-D210U

POS Printer:　Serial interface printer with a display connector installed, or a printer with USB I/F-BOARD installed.

(3) The case where only a display is connected to the PC
(Independent)

Host		Device
PC	→	LineDisplay
(RS232C)		
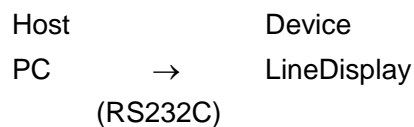
PC:　　　　COM1-COM10
LineDisplay:　DM-D110, DM-D210

(4) The case where only a display is connected to the IT(IR)
(Independent)

Host		Device
IR	→	LineDisplay
(Modular)		
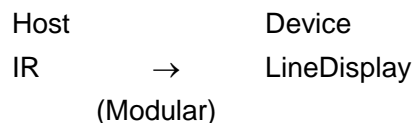
IR:　　　　COM4
LineDisplay:　DM-D120

When used with a Y(hydra) connection, please check that the following settings have been performed correctly.

• RS-232C cable in which RTS and CTS have not been connected must be

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used (serial port)

- For the printer's DIP Switches, the switch used for the customer display must be set to ON.
- Y(hydra) settings must have been correctly made using the SetupPOS utility.
- When using USB port connection, the display's modular connection must be made to the USB I/F-BOARD and not to the printer's DM-D connector.

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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   CheckHealth Method
3.1.1 Internal Test

When executed, communications with the display is performed and the result is returned. Nothing is shown on the display.

When the method is executed by OPOS_CH_INTERNAL, the character strings of the CheckHealthText property is as follows.

"Internal Hcheck: Complete"   :   CheckHealthText

After executing the CheckHealth method, be sure to confirm the returned value. If an error has occurred, there is no point in referring to the CheckHealthText property. For details on the occurred error, refer to the Section 6 of this manual.

3.1.2 External Test

When executed, the following character strings are sent to and displayed on the display.

External Hcheck!!
DeviceName=Model name

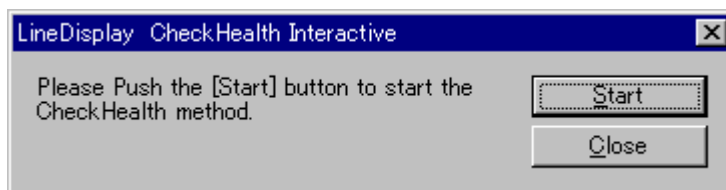Confirm that the displayed contents are correct.

When the method is executed by OPOS_CH_EXTERNAL, the character strings of the CheckHealthText property is as follows.

"External Hcheck: Complete"   :   CheckHealthText

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After executing the CheckHealth method, be sure to confirm the returned value. If an error has occurred, there is no point in referring to the CheckHalthText property. For details on the occurred error, refer to the Section 6 of this manual.

3.1.3　Interactive Test

Executes interactive CheckHealth test. When executed, the following dialog box is displayed.

```
┌─────────────────────────────────────────────────────┐
│ LineDisplay  CheckHealth Interactive              [X]│
├─────────────────────────────────────────────────────┤
│ Please Push the [Start] button to start the   ┌──────────┐ │
│ CheckHealth method.                            │  Start   │ │
│                                                └──────────┘ │
│                                                ┌──────────┐ │
│                                                │  Close   │ │
│                                                └──────────┘ │
└─────────────────────────────────────────────────────┘
```

When [Start] is selected, the following character strings are sent to and displayed on the display.

　Interactive Hcheck!!

　DeviceName= Device name

Confirm that the displayed contents are correct.

When the method is executed by OPOS_CH_INTERACTIVE, the character strings of the CheckHealthText property are as follows.

"Interactive Hcheck: Canceled"	:	When the [Close] button is pressed without the [Start] button having been pressed even once.
"Interactive Hcheck: Complete"	:	When the [Close] button is pressed after the [Start] button has been pressed.

After executing the CheckHealth method, be sure to confirm the returned value. If an error has occurred, there is no point in referring to the CheckHalthText property. For details on the occurred error, refer to the Section 6 of this manual.

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3.2 Property Set Values and Default Values

3.2.1 Capability Set Value

Capability Name	Set Value (DM-D110/D120)	Set Value (DM-D210)
CapBlink	DISP_CB_BLINKALL	Same as DM-D110/D120
CapBrightness	TRUE	Same as DM-D110/D120
CapCharacterSet	DISP_CCS_KANA	Same as DM-D110/D120
CapDescriptors	FALSE	TRUE
CapHMarquee	TRUE	Same as DM-D110/D120
CapVMarquee	FALSE	Same as DM-D110/D120
CapICharWait	TRUE	Same as DM-D110/D120
CapPowerReporting	OPOS_PR_STANDARD	Same as DM-D110/D120
CapBlinkRate	TRUE	Same as DM-D110/D120
CapCursorType	DISP_CCT_NONE	Same as DM-D110/D120
CapCustomGlyph	TRUE	Same as DM-D110/D120
CapReadBack	DISP_CRB_SINGLE	Same as DM-D110/D120
CapReverse	DISP_CR_REVERSEEACH	Same as DM-D110/D120
CapBitmap	FALSE	Same as DM-D110/D120
CapMapCharacterSet	FALSE	Same as DM-D110/D120
CapScreenMode	FALSE	Same as DM-D110/D120

3.2.2 Property Default Set Values and Setting Ranges

● Brightness setting range and default value

Set Value	DeviceBrightness
0-19	0%
20-39	20%
40-59	40%
60-79	60%
80-100	100% [1]

[1] Denotes the default value.

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● Code page setting range and default value

	Set Value (DM-D110, D120, D210)
CaracterSetList	437 *1, 850, 852, 858, 860, 863, 865, 866, 932, 998, 999, 1252, 254, 255

*1 Denotes the default value.

● Relations between CharacterSet and set values

CharacterSet	Page No. Set Value
437 *1	Page 0
850	Page 2
852	Page 18
858	Page 19
860	Page 3
863	Page 4
865	Page 5
866	Page 16
932	Page 1
998	Page 0
1252 (999)	Page 16
254	Page 254
255	Page 255

*1 Default value

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● Set values of other properties

Property Name	Set Value (DM-D110/D120)	Set Value (DM-D210)
DeviceWindow	4	4
DeviceRows	2	2
DeviceColumns	20	20
DeviceDescriptors	0	20
CustomGlyphList	20-7E	20-7E
GlyphHeight	7	7
GlyphWidth	5	5
MapCharacterSet	FALSE	FALSE
MaximumX	0	0
MaximumY	0	0
ScreenMode	0	0
ScreenModeList	2x20	2x20

3.3 Restrictions on Parameters for Methods

Method Name	Parameter	Max. Value
CreateWindow	WindowHeight	Up to 1024
	WindowWidth	Up to 1024

3.4 Supplementary Explanation of Functions

3.4.1 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.

3.4.2 Marquee Operation when the ClaimDevice Method is executed and the DeviceEnable Property is set to TRUE after Executing the ReleaseDevice Method.

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.

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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.

3.4.3 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.

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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).

3.4.4 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.

3.5 Device Statistics

The DeviceStatistics function is added in response to the compliance of the "UPOS 1.8".

Please refer to the "EPSON OPOS ADK MANUAL APPLICATION GUIDE Device Statistics" for the details of the Device Statistics.

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Section 4.   Expanded Functions

This section describes the expanded functions of the LineDisplay device.

4.1 DirectIO Function

The usage of the DirectIO method and DirectIOEvent event is described below.

4.1.1 DirectIO Method

Syntax   DirectIO   *Command* As Long, *pData* As Long, *pString* As String

Parameter	Explanation
Command	Output format. Normally set to DISP_DI_OUTPUT*.
pData	Not used. Normally DISP_DI_DUMMY will be entered.
pString	ESC/POS command, character variable storing the data containing NULL.

 * The DISP_DI_SYNC command of Ver1.xx can also be used.

Remarks   The entire character strings set in the *pString* variable will be sent to the communications port as it is. In case of sending to the display, it is necessary to add the display selecting command (ESC=2) before the data.

Return   Either of the following values is returned, and stored in the ResultCode property.

Value	Meaning
OPOS_SUCCESS	DirectIO successful.
OPOS_E_CLOSED	Control is closed.
OPOS_E_NOTCLAIMED	The device is not claimed.
OPOS_E_DISABLED	Device is not enabled.
OPOS_E_ILLEGAL	Command cannot be output to device.
OPOS_E_FAILURE	Problem with the device.
OPOS_E_OFFLINE	The device is offline.

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Prerequisites Open, Claim & Enable

4.1.2　DirectIOEvent Event

No applicable

4.2　List of Commands Usable with DirectIO

The commands that can be output using DirectIO are described below. Outputting other than these commands will affect the OPOS settings and subsequent operation of OPOS cannot be guaranteed.

● Common for DM-D110/DM-D120, DM-D210

Command	Meaning
CLR	Clears the display screen
CAN	Clears the display position line
ESC %	For specifying and canceling setting of downloaded characters
ESC &	For definition of downloaded characters
ESC ?	For deleting downloaded characters
US T	For setting and displaying the counter (time)
US U	For displaying the counter (time)
US r	For specifying and canceling highlighted characters
US:	For starting and ending definition of the contents of macro processing
US ^	For executing macro processing

● DM-D210 only

Command	Meaning
US .	For specifying display of period characters
US ,	For specifying display of comma characters
US ;	For specifying (period) + (comma)

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Section 5.　Device Specific Programming

This section describes device specific programming of the LineDisplay devices.

5.1　Issuing ESC/POS Commands

The EPSON DM series LineDisplay supports various ESC/POS commands. The DirectIO method is used to output these commands. For the DirectIO method specifications, see the Section 4 of this manual.

Example showing how to issue the command for clearing the LineDisplay:

```
Dim RC As Long
Dim Dummy As Long
Dim DispSelect As String
Dim Data As String
Dummy=DISP_DI_DUMMY
DispSelect = Chr(&H1B) + "=" + Chr(&H2)
Data=Chr(&H0C)
RC=OPOSLineDisplay1.DirectIO( DISP_DI_OUTPUT,
                                `Normally synchronous output
                    Dummy,          `Normally DISP_DI_DUMMY
                    DispSelect + Data )`Display selection + CLR
If RC=OPOS_SUCCESS Then
        `Successful
Else
        `Error
End If
```

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Section 6.   Error Information

This section describes the error codes that may result from execution of LineDisplay methods. The common properties and methods are described in "EPSON OPOS ADK MANUAL APPLICATION DEVELOPMENT GUIDE GENERAL DEVELOPMENT". Refer to this guide for more information.

6.1 ResultCode List

6.1.1 When Executing Properties

The ResultCode and ResultCodeExtended when properties are executed are as follows.

Property Name	ResultCode	ResultCodeExtended	Meaning
DeviceBrightness	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_NOTCLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_DISABLED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_INCAPABLE	Function cannot be used.
		OPOS_EX_DEVBUSY	The device is busy.
		OPOS_EX_TIMEOUT	Output result is not returned within the timeout period.
		OPOS_EX_BADPROPVAL	Set value is illegal.
	OPOS_E_OFFLINE	0	Refer to *UPOS Specifications.*
		OPOS_EPTR_COVER_OPEN	Printer cover is open.
		OPOS_EPTR_JRN(REC)_EMPTY	No paper in printer.
	OPOS_E_FAILURE	OPOS_EX_MICRMODE	Printer is in MICR mode.
		POSPrinter condition errors [*1]	Refer to *UPOS Specifications.*

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Property Name	ResultCode	ResultCodeExtended	Meaning
CharacterSet	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_CLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_NOTCLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_DISABLED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_BADPROPVAL	Set value is illegal.
CurrentWindow	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_BADPROPVAL	Set value is illegal.
CursorRow	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_BADPROPVAL	Set value is illegal.
CursorColumn	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_BADPROPVAL	Set value is illegal.
CursorUpdate	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
MarqueeType	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_FAILURE	OPOS_EX_MICRMODE	Printer is in MICR mode.
	OPOS_E_ILLEGAL	OPOS_EX_BADPROPVAL	Set value is illegal.
		OPOS_EX_INCAPABLE	Function cannot be used.
MarqueeFormat	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_BADPROPVAL	Set value is illegal.
MarqueeUnitWait	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_BADPROPVAL	Set value is illegal.
MarqueeRepeatWait	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_BADPROPVAL	Set value is illegal.

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Property Name	ResultCode	ResultCodeExtended	Meaning
InterCaracterWait	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_BADPROPVAL	Set value is illegal.
BlinkRate	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_BADPROPVAL	Set value is illegal.
		OPOS_EX_INCAPABLE	Function cannot be used.
CursorType	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_BADPROPVAL	Set value is illegal.
		OPOS_EX_INCAPABLE	Function cannot be used.
MapCharacterSet	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_INCAPABLE	Function cannot be used.
ScreenMode	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	0	Refer to *UPOS Specifications.*
		OPOS_EX_INCAPABLE	Function cannot be used.

[*1] The POSPrinter condition errors are as follows:

OPOS_EPTR_COVER_OPEN

OPOS_EPTR_JRN_EMPTY

OPOS_EPTR_REC_EMPTY

OPOS_EPTR_REC_CARTRIDGE_REMOVED

OPOS_EPTR_REC_CARTRIDGE_EMPTY

OPOS_EPTR_REC_HEAD_CLEANING

OPOS_EPTR_LABEL_JAM

OPOS_EPTR_MECHANICAL

OPOS_EPTR_CUTTER

OPOS_EPTR_UNRECOVERABLE

OPOS_EPTR_AUTORECOVERABLE

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6.1.2 When Executing Methods

The ResultCode and ResultCodeExtended when methods are executed are as follows.

Method Name	ResultCode	ResultCodeExtended	Meaning
DisplayText	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_NOTCLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_DISABLED	0	Refer to *UPOS Specifications.*
	OPOS_E_CLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_INVALIDMODE	Marquee is under execution.
		OPOS_EX_BADPARAM+1	*Data* parameter does not comply with the BinaryConversion property.
		OPOS_EX_BADPARAM+2	*Attribute* parameter is illegal.
		OPOS_EX_DEVBUSY	Device is busy.
		OPOS_EX_TIMEOUT	Output result is not returned within timeout period.
	OPOS_E_FAILURE	0	Refer to *UPOS Specifications.*
		OPOS_EX_MICRMODE	Printer is in MICR mode.
		POSPrinter condition errors [*1]	Refer to *UPOS Specifications.*
DisplayTextAt	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_NOTCLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_DISABLED	0	Refer to *UPOS Specifications.*
	OPOS_E_CLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_INVALIDMODE	Marquee is under execution.
		OPOS_EX_BADPARAM+1	*Row* parameter is illegal.
		OPOS_EX_BADPARAM+2	*Column* parameter is illegal.
		OPOS_EX_BADPARAM+3	*Data* parameter does not comply with the BinaryConversion property.
		OPOS_EX_BADPARAM+4	*Attribute* parameter is illegal.
		OPOS_EX_DEVBUSY	Device is busy.
		OPOS_EX_TIMEOUT	Output result is not returned within the timeout period.

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Method Name	ResultCode	ResultCodeExtended	Meaning
(DisplayTextAt)	OPOS_E_FAILURE	0	Refer to *UPOS Specifications.*
		OPOS_EX_MICRMODE	Printer is in MICR mode.
		POSPrinter condition errors [*1]	Refer to *UPOS Specifications.*
ClearText	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_NOTCLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_DISABLED	0	Refer to *UPOS Specifications.*
	OPOS_E_CLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_INVALIDMODE	Marquee is under execution.
		OPOS_EX_DEVBUSY	Device is busy.
		OPOS_EX_TIMEOUT	Output result is not returned within the timeout period.
	OPOS_E_FAILURE	OPOS_EX_MICRMODE	Printer is in MICR mode.
		POSPrinter condition errors [*1]	Refer to *UPOS Specifications.*
CreateWindow	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_NOTCLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_DISABLED	0	Refer to *UPOS Specifications.*
	OPOS_E_CLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EDISP_TOOMANYWINDOWS	All available windows are in use.
		OPOS_EX_BADPARAM+1	*ViewportRow* parameter is illegal.
		OPOS_EX_BADPARAM+2	*ViewportColumn* parameter is illegal.
		OPOS_EX_BADPARAM+3	*ViewportHeight* parameter is illegal.
		OPOS_EX_BADPARAM+4	*ViewportWidth* parameter is illegal.
		OPOS_EX_BADPARAM+5	*WindowHeight* parameter is illegal.
		OPOS_EX_BADPARAM+6	*WindowWidth* parameter is illegal.
	OPOS_E_FAILURE	0	Refer to *UPOS Specifications.*
DestroyWindow	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_NOTCLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_DISABLED	0	Refer to *UPOS Specifications.*
	OPOS_E_CLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	0	Refer to *UPOS Specifications.*

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Method Name	ResultCode	ResultCodeExtended	Meaning
RefreshWindow	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_NOTCLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_DISABLED	0	Refer to *UPOS Specifications.*
	OPOS_E_CLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_INVALIDMODE	Marquee is under execution.
		OPOS_EX_BADPARAM+1	The window specified in the *Window* parameter does not exist.
		OPOS_EX_DEVBUSY	Device is busy.
		OPOS_EX_TIMEOUT	Output result is not returned within the timeout period.
	OPOS_E_FAILURE	OPOS_EX_MICRMODE	Printer is in MICR mode.
		POSPrinter condition errors [*1]	Refer to *UPOS Specifications.*
ScrollText	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_NOTCLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_DISABLED	0	Refer to *UPOS Specifications.*
	OPOS_E_CLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_INVALIDMODE	Marquee/teletype is under execution.
		OPOS_EX_BADPARAM+1	*Direction* parameter is illegal.
		OPOS_EX_BADPARAM+2	*Units* parameter is illegal.
		OPOS_EX_DEVBUSY	Device is busy.
	OPOS_E_FAILURE	OPOS_EX_MICRMODE	Printer is in MICR mode.
		POSPrinter condition errors [*1]	Refer to *UPOS Specifications.*

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Method Name	ResultCode	ResultCodeExtended	Meaning
SetDescriptor	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_NOTCLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_DISABLED	0	Refer to *UPOS Specifications.*
	OPOS_E_CLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_BADPARAM+1	*Descriptor* parameter is illegal.
		OPOS_EX_BADPARAM+2	*Attribute* parameter is illegal.
		OPOS_EX_INCAPABLE	*CapDescriptors* is False.
		OPOS_EX_DEVBUSY	Device is busy.
		OPOS_EX_TIMEOUT	Output result is not returned within the timeout period.
	OPOS_E_FAILURE	OPOS_EX_MICRMODE	Printer is in MICR mode.
		POSPrinter condition errors [*1]	Refer to *UPOS Specifications.*
ClearDescriptors	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_NOTCLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_DISABLED	0	Refer to *UPOS Specifications.*
	OPOS_E_CLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_INCAPABLE	Device has no descriptor.
		OPOS_EX_DEVBUSY	Device is busy.
		OPOS_EX_TIMEOUT	Output result is not returned within the timeout period.
	OPOS_E_FAILURE	OPOS_EX_MICRMODE	Printer is in MICR mode.
		POSPrinter condition errors [*1]	Refer to *UPOS Specifications.*
ReadCharacterAtCursor	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_NOTCLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_DISABLED	0	Refer to *UPOS Specifications.*
	OPOS_E_CLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_INCAPABLE	*CapReadBack* is FALSE.

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LineDisplay (DM-D110/ DM-D120/ DM-D210)

Method Name	ResultCode	ResultCodeExtended	Meaning
DefineGlyph	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_NOTCLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_CLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_DISABLED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_INCAPABLE	*CapCustomGlyph* is FALSE.
		OPOS_EX_BADPARAM+1	A character code outside the range set with *CustomGlyphList* is used.
		OPOS_EX_BADPARAM+2	The *Glyph* parameter is invalid.
		OPOS_EX_DEVBUSY	Device is busy.
		OPOS_EX_TIMEOUT	Output result is not returned within the timeout period.
		OPOS_EX_MICRMODE	Printer is in MICR mode.
		OPOS_EDISP_TOOMANYDEFGLYPH	The *Glyph* character cannot be defined any further.
	OPOS_E_FAILURE	POSPrinter condition errors [*1]	Refer to *UPOS Specifications.*
DisplayBitmap	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_NOTCLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_DISABLED	0	Refer to *UPOS Specifications.*
	OPOS_E_CLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_INCAPABLE	*CapBitmap* is FALSE.
		OPOS_EX_BADPARAM+1	*ViewportRow* parameter is illegal.
		OPOS_EX_BADPARAM+2	*ViewportColumn* parameter is illegal.
		OPOS_EX_BADPARAM+3	*ViewportHeight* parameter is illegal.
		OPOS_EX_BADPARAM+4	*ViewportWidth* parameter is illegal.

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Method Name	ResultCode	ResultCodeExtended	Meaning
SetBitmap	OPOS_SUCCESS	0	Refer to *UPOS Specifications.*
	OPOS_E_CLOSED	0	Refer to *UPOS Specifications.*
	OPOS_E_NOTCLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_DISABLED	0	Refer to *UPOS Specifications.*
	OPOS_E_CLAIMED	0	Refer to *UPOS Specifications.*
	OPOS_E_ILLEGAL	OPOS_EX_INCAPABLE	*CapBitmap* is FALSE.
		OPOS_EX_BADPARAM+1	*ViewportRow* parameter is illegal.
		OPOS_EX_BADPARAM+2	*ViewportColumn* parameter is illegal.
		OPOS_EX_BADPARAM+3	*ViewportHeight* parameter is illegal.
		OPOS_EX_BADPARAM+4	*ViewportWidth* parameter is illegal.
		OPOS_EX_BADPARAM+5	*WindowHeight* parameter is illegal.

[*1] The POSPrinter condition errors are as follows:

OPOS_EPTR_COVER_OPEN

OPOS_EPTR_JRN_EMPTY

OPOS_EPTR_REC_EMPTY

OPOS_EPTR_REC_CARTRIDGE_REMOVED

OPOS_EPTR_REC_CARTRIDGE_EMPTY

OPOS_EPTR_REC_HEAD_CLEANING

OPOS_EPTR_LABEL_JAM

OPOS_EPTR_MECHANICAL

OPOS_EPTR_CUTTER

OPOS_EPTR_UNRECOVERABLE

OPOS_EPTR_AUTORECOVERABLE

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6.2　Remedial Actions for Principal Errors

ResultCodeExtended	Remedy
OPOS_EX_DEVBUSY, OPOS_EX_TIMEOUT	If the power to the display is disconnected, it is necessary to once apply Close and then invoke Open/Claim/Enable again.
OPOS_EPTR_COVER_OPEN, OPOS_EPTR_JRN(REC)_EMPTY, OPOS_EPTR_CUTTER, OPOS_EPTR_UNRECOVERABLE, OPOS_EPTR_MECHANICAL, OPOS_EPTR_OVERHEAT, OPOS_EX_MICRMODE	Confirm the status of the printer, and then execute the methods and properties again.
OPOS_EX_BADPARAM + x	The parameter is not correct for the method to be used. Confirm the parameter range for the method to be used.
OPOS_EX_INCAPABLE	After confirming the capability, switch to a program that executes the method.
OPOS_EX_BADPROPVAL	Using "UPOS", recheck the specifications of the methods and properties and setting conditions for the methods and properties as described in this manual.
OPOS_EDISP_TOOMANYDEFGLYPH	Define Glyph in the character code by which Glyph has already been defined. In this case, the old Glyph definition is overwritten.

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Section 7.   Warnings

● When using the DirectIO method to issue a command, be sure to read the instructions on the particular command in the product manual.

● When adding a device by hydra settings, 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 &H80 to &HFF that is not sent correctly. Accordingly, some data patterns of the downloaded characters cannot be specified.

● When a hydra-connected printer 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. ResultCodeExtedned=Printer error details, etc. will be generated. Teletype display and Marquee display will not be updated while the printer is in the busy state.

● When using USB port connection, set the printer's DIP-switch to Display connection if the printer has a terminal for DM-D connection.

● 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 envirionment, there can be a case of missing data when tranmitting 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.   (Recommended value: "1")

● If the ReadCharacterAtCursor method is executed when there is no character information at the cursor position, character code 127 is returned.

● The Glyph information defined by the DefineGlyph method disappears and cannot be displayed when the power supply on the display is turned on or off.

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- The number of Glyph characters that can be defined by the DefineGlyph method is decided by each model.

Model	Number of characters
DM-D110, DM-D120, DM-D210	95 characters

- The error code differs by that timing when the power is turned OFF.

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