TOSHIBA

Windows POS Terminal

TEC OPOS Control

Line Display OPOS Application Programmer's Guide for LIUST-C10BI

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1. Introduction

The Line Display Application Programmer's Guide (hereinafter referred to as "this manual") was documented in accordance with the "UnifiedPOS Specifications Version 1.2" (hereinafter refered to as "UPOS Specification") which was published by the UnifiedPOS Committee for the purpose of standardization.

This manual mainly describes the specifications which are different from those described in the UPOS Specification and which are not described in it because they are Toshiba TEC's own specifications. For specifications not provided in this manual, please refer to the UPOS Specification.

Unless otherwise specified, this manual focuses on DeviceService.

The UPOS Specification can be downloaded from the following web site:

ARTS Home Page: http://www.nrf-arts.org/

Notes

Before reading this manual, please note the following:

- It is prohibited to use or duplicate a part or whole of this manual without the permission of Toshiba TEC Corporation.
- This manual is subject to change without prior notice.

2. Target Reader of This Manual

This document assumes that the reader is familiar with the following:

- General characteristics of POS peripheral devices
- General characteristics of Toshiba POS terminals and their peripheral devices
- General features of Windows

3. LineDisplay

The module Service Object is as follows:
LIUST-C10BI.dll / LIUST-C10CN.dll (China Model)

3.1. Supported Operating Systems

This Device Service supports the following operating systems.

- Windows XP Professional
- Windows Embedded for Point of Service1.1(WEPOS1.1)
- Windows Embedded POSReady 2009
- Windows 7 Professional
- Windows Embedded POSReady 7

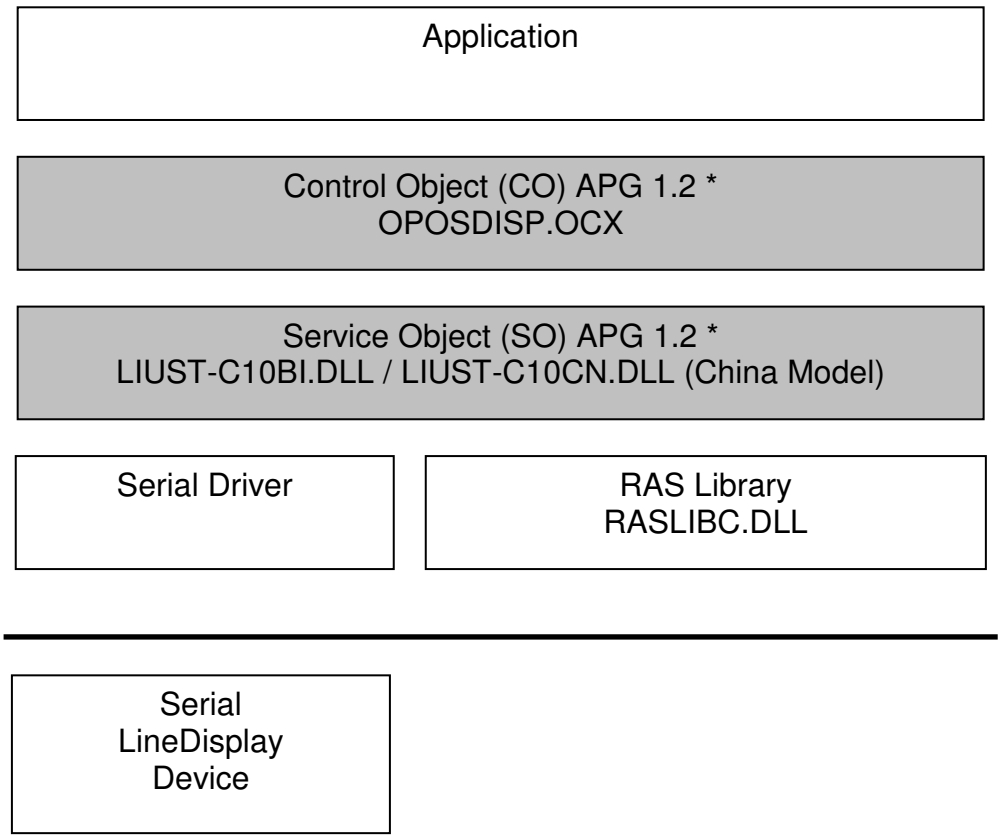
3.2. Supported Device

This Device Service supports the following device.

- LIUST-C10 line display
- LIUST-C10 line display (China Model)

3.3. Architecture Overview

This control is constituted by this software module as below.



* This is a module constituting this control.

3.4. Functions and Properties

Support	Doesn't Support
Horizontal/Vertical marquee scroll Displays by Teletype mode Displays the Character Brightness control of device	Lights on/off Descriptor Displays the Kana-character Changes the Display mode Blinks of Descriptor Reverse video of each character/device Blink video of each character/device Setting of Blinking rate Setting of character defined by user Mapping of character sets Displays the Bitmap Escape sequence Setting of cursor type Read back of the displaying character by device Accumulation of statistics Reset of statistics Reports of power status

LIUST-C10BI & LIUST-C10BICN Line Display Control Function

Properties (There is writing only the fixed thing which depend on a type of device.)

Common Properties	Value
ControlObjectDescription	"TEC OPOS Line Display Control Object"
ControlObjectVersion	"1002xxx"
ServiceObjectDescription	"TEC OPOS Line Display Service Object"
ServiceObjectVersion	"1002xxx"
DeviceDescription	"LIUST-C10 Built In Serial Line Display"
DeviceName	"TEC LIUST-C10BI"
Device Specific Properties	Value
CapBitmap	FALSE
CapBlink	DISP_CB_NOBLINK
CapBlinkRate	FALSE
CapBrightness	TRUE
CapCharacterSet	DISP_CCS_ASCII
CapCursorType	DISP_CCT_BLINK
CapCustomGlyph	FALSE
CapDescriptors	FALSE
CapHMarquee	TRUE
CapICharWait	TRUE
CapMapCharacterSet	FALSE
CapReadBack	DISP_CRB_NONE
CapReverse	DISP_CR_NONE
CapScreenMode	FALSE
CapVMarquee	TRUE
CharacterSet	101
CharacterSetList	"101"
CursorType	DISP_CT_NONE
DeviceWindows	999
DeviceRows	4 / 3 (China Model)
DeviceColumns	20 / 16 (China Model)
DeviceDescriptors	0

LIUST-C10BI & LIUST-C10BICN Line Display Control Properties value (A part of items)

Escape-sequence to work only a time when it was ordered.

Function	Data	
Displays Bitmap	ESC|#B	X

Escape-sequence to work only a time when it was printing.

Function	Data	
Reverse character	ESC|rvC	X
Blink	ESC|kC	X
Normal	ESC|N	X

O : Support X : Not Support (The escape sequence that is not recognized)

LIUST-C10BI & LIUST-C10BICN Line Display Control Escape sequence

3.5. Specification of CheckHealth

1) Internal Level (OPOS_CH_INTERNAL)

Confirms the connection status of device and terminal via circuit status.
A MessageBox "Internal Check Health OK!" will be shown if it is success

Return value (ResultCode)	CheckHealthText	Description
OPOS_SUCCESS	"Internal HCheck:Connected"	Connected
	"Internal HCheck:Disconnected"	Not Connected
OPOS_E_NOTCLAIMED	"HCheck: Exclusive"	Claim error
OPOS_E_DISABLED	"HCheck: Disabled"	Device Disable

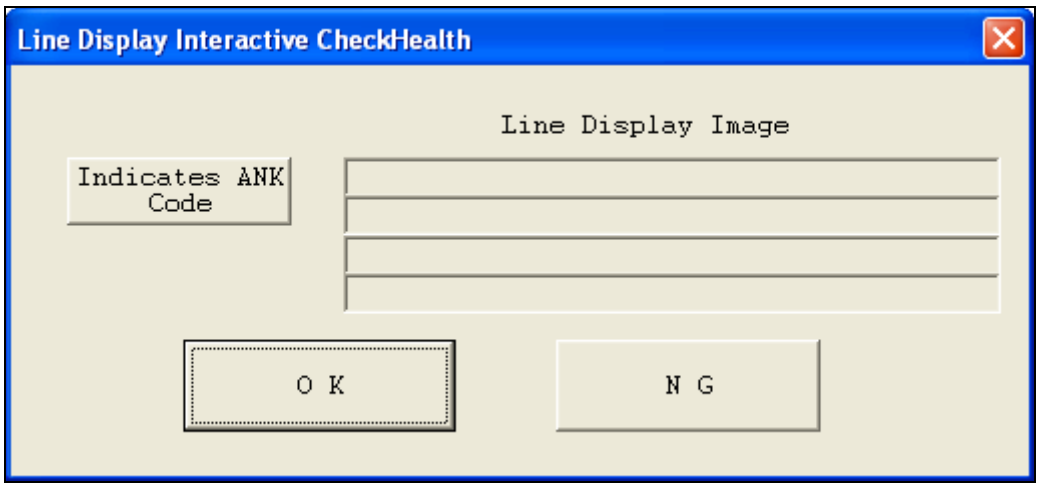
2) External Level (OPOS_CH_EXTERNAL)

Line display will scroll the following string from left to right in Row 1
"TEC Line Display LIUSTCx0 OPOS CheckHealth:External"
A MessageBox "External Check Health OK!" will be shown if it is success

Return value (ResultCode)	CheckHealthText	Description
OPOS_SUCCESS	"External HCheck: Complete"	Success
OPOS_E_TIMEOUT	"External HCheck: Error"	Device busy
OPOS_E_NOTCLAIMED	"HCheck: Exclusive"	Claim error
OPOS_E_DISABLED	"HCheck: Disabled"	Device Disable

3) Interactive Level (OPOS_CH_INTERACTIVE)

The dialog box appears as below.
User can check the Line indicator unit by using this dialog utility.
So, click on the 'Indicates ANK Code' button, then LIUST-C10 displays all the characters which are shown in the Dialog.
Then, select the OK button or the NG button based on checking by yourself.



Return value (ResultCode)	CheckHealthText	Description
OPOS_SUCCESS	"Interactive HCheck: Successful"	Finishes with OK button
OPOS_E_FAILURE	"Interactive HCheck: Error"	Finishes with NG button
OPOS_E_NOTCLAIMED	"HCheck: Exclusive"	Claim error
OPOS_E_DISABLED	"HCheck: Disabled"	Device Disable

3.6. Specification of DirectIO

About this control, no extensional function is supported by DirectIO method.

Command	Function
DISP_DIO_DIRECTOUTPUT	Output directly

Constant value that is used in DirectIO of this control is defined on 'TecDisp.h'.
We recommend to using it in this file and the module of the pair.

3.6.1. Output Directly

Function Outputs directly to LineDisplay.

Format

Parameter	**Description**
Command	DISP_DIO_DIRECTOUTPUT
pData	N/A (must fix it to 0)
pString	String what you want to display

Description When you use this function, you must finish the process 'Open', 'Claim' and 'DeviceEnabled = TRUE'. This method outputs the strings directly.

Notice It isn't recognized even if there is the escape code into this string. The format of this string is relating on BinaryConversion property.
The status of device is uncertainty after this command performed.

Return It returns one of the status from list below, and it is stored in ResultCode-property.

Value	**Description**
OPOS_SUCCESS	Success of the process
OPOS_E_CLOSED	This control is closing
OPOS_E_NOTCLAIMED	This device isn't claimed till now.
OPOS_E_DISABLED	This device is disabled
OPOS_E_ILLEGAL	Memory could not be allocated.
OPOS_E_NOHARDWARE	The power cut off.
OPOS_E_TIMEOUT	The timeout occurred.
OPOS_E_FAILURE	The communication error occurred.

3.6.2. Read ID

Function Read the ID string from the device.

Format

Parameter	Description
Command	DISP_DIO_READID
pData	N/A (must fix it to 0)
pString	For storing text strings

Description When you use this function, you must finish the process 'Open', 'Claim' and 'DeviceEnabled = TRUE'. This method Read the 25 bytes ID string from the device.

Notice ID string format is depend on BinaryConversion property.

Return It returns one of the status from list below, and it is stored in ResultCode-property.

Value	Description
OPOS_SUCCESS	Success of the process
OPOS_E_CLOSED	This control is closing
OPOS_E_NOTCLAIMED	This device isn't claimed till now.
OPOS_E_DISABLED	This device is disabled
OPOS_E_OFFLINE	This device is turned off or No device is connected.
OPOS_E_ILLEGAL	Read ID failed. Could not allocate memory.
OPOS_E_NOHARDWARE	The power cut off.
OPOS_E_TIMEOUT	The timeout occurred.
OPOS_E_FAILURE	The communication error occurred.

3.6.3. Country Code Setting

Function Set country code to the device.

Format

Parameter	Description
Command	DISP_DIO_COUNTRYCODE
pData	Country Code
pString	NA(Null"" is used)

Description When you use this function, you must finish the process 'Open', 'Claim' and 'DeviceEnabled = TRUE'. Set country code to the device.
List of Country Codes:

Country Code	Country	Country Code	Country
0	US	10	Denmark 2
1	France	11	Spain 2
2	Germany	12	Latin America
3	UK	13	East Europe
4	Denmark 1	14	Ice Land
5	Sweden	15	Greek
6	Italy	16	Greek 2
7	Spain 1	17	Cyrillic
8	Japan	112	China
9	Norway		

* for Standard model LIUST-C10BI, user is allow to set the above country code beside China(112), while China Model LIUST-C10BICN only allow user to set China(112) but not other country code. In case user set invalid Country Code to LIUST-C10BI device, Firmware will ignore this setting.

Notice ID Country code will be restored when the device is enabled.
If user change the country code, character in display unit will be changed according to the new country code.

Return It returns one of the status from list below, and it is stored in ResultCode-property.

Value	Description
OPOS_SUCCESS	Success of the process
OPOS_E_CLOSED	This control is closing
OPOS_E_NOTCLAIMED	This device isn't claimed till now.
OPOS_E_DISABLED	This device is disabled
OPOS_E_OFFLINE	This device is turned off or No device is connected.
OPOS_E_ILLEGAL	Invalid country code.
OPOS_E_NOHARDWARE	The power cut off.
OPOS_E_TIMEOUT	The timeout occurred.
OPOS_E_FAILURE	The communication error occurred.

3.6.4. Display Text Extension

Function Displays text sent to the device with a display character properties.

Format

Parameter | **Description**

Command	DISP_DIO_DISPLAYTEXT_EXTEND
pData	Character Attributes
pString	Display string

Description When you use this function, you must finish the process 'Open', 'Claim' and 'DeviceEnabled = TRUE'.
Displays text sent to the device with a display character properties.
It is not affected by other OPOS methods which have inconsistent display character attribute.
If current window is either in Marquee scroll or Teletype mode, calling this method will be failed.
List of Character Attributes:

Character Attributes	Meaning
0	Reset (normal text)

Notice The string which has shown in present Display unit does not comply with the escape sequence by the method call.
The display string format is depends on the BinaryConversion property.
If the character attributes value is out of defined value, OPOS_E_ILLEGAL error will be occurred.
If unsupported character is used, Display unit might show incorrect outcome.

Return It returns one of the status from list below, and it is stored in ResultCode-property.

Value	**Description**
OPOS_SUCCESS	Success of the process
OPOS_E_CLOSED	This control is closing
OPOS_E_NOTCLAIMED	This device isn't claimed till now.
OPOS_E_DISABLED	This device is disabled
OPOS_E_OFFLINE	This device is turned off or No device is connected.
OPOS_E_BUSY	Current Window is executing Marquee scroll
OPOS_E_ILLEGAL	The parameter is incorrect. Could not allocate memory.
OPOS_E_NOHARDWARE	The power cut off.
OPOS_E_TIMEOUT	The timeout occurred.
OPOS_E_FAILURE	The communication error occurred.

3.7. Registry setting of OPOS

3.7.1. Standard Model (LIUST-C10BI) registry information as below:

HKEY_LOCAL_MACHINE\SOFTWARE\OLEforRetail\ServiceOPOS\LineDisplay\LIUST-C10BI

Common	"TEC.LIUST-C10BI.S"
Service	"C:\OPOS\TEC\LIUST-C10BI.dll"
Description	"TEC LIUST-C10 Built In Serial Line Display"
Version	"1.2"
Port	"COM2"
BaudRate	"115200"
Country	"0" ～ "17"
DebugLogFile	"C:\OPOS\TEC\LOG\LIUST-C10BI.LOG"
DebugLogLevel	"1"
BatteryModeBrightness	60

Service	File name of this Service Object
Description	Description of this Service Object
Version	Version of this Service Object
Port	Port name to connect the LIUST-C10 One of the port from COM1 to COM10 This setting can be set from OPOS control panel.
BaudRate	Baud rate (Communication speed of RS-232C) Fixed 115200 This setting can be set from OPOS control panel.
DebugLogFile	Specifies a log file with path which records OPOS operations. If a folder does not exist, no log is kept.
DebugLogLevel	Specifies a level for recording a log in a file specified by DebugLogFile. 0: Log is not output. 1: Level where a log is recorded mainly at a time of error
Country	Country Code For different country business operation, the ASCII character portion of country code can be set. Select the best character of each country. 0 US 10 Denmark 2 1 France 11 Spain 2 2 Germany 12 Latin America 3 UK 13 East Europe 4 Denmark 1 14 Ice Land 5 Sweden 15 Greek 6 Italy 16 Greek2 7 Spain 1 17 Cyrillic 8 Japan 9 Norway Can be set in Control Panel
BatteryModeBrightness	Specifies the Line Display Backlight Brightness to be set when POS terminal switch to DC (Battery Mode). Default value: 60 Valid value range: 0 to 100

LIUST-C10BI Line Display Control Registry

3.7.2. China Model (LIUST-C10BICN) registry information as below:

HKEY_LOCAL_MACHINE\SOFTWARE\OLEforRetail\ServiceOPOS\LineDisplay
\LIUST-C10BICN

Common	"TEC. LIUST-C10BICN.S"
Service	"C:\OPOS\TEC\ LIUST-C10CN.dll"
Description	"TEC LIUST-C10 Built In Serial Line Display (CN)"
Version	"1.2"
Port	"COM2"
BaudRate	"115200"
Country	"112"
DebugLogFile	"C:\OPOS\TEC\LOG\LIUST-C10BICN.LOG"
DebugLogLevel	"1"
BatteryModeBrightness	60

Service	File name of this Service Object
Description	Description of this Service Object
Version	Version of this Service Object
Port	Port name to connect the LIUST-C10 One of the port from COM1 to COM10 This setting can be set from OPOS control panel.
BaudRate	Baud rate (Communication speed of RS-232C) Fixed 115200 This setting can be set from OPOS control panel.
DebugLogFile	Specifies a log file with path which records OPOS operations. If a folder does not exist, no log is kept.
DebugLogLevel	Specifies a level for recording a log in a file specified by DebugLogFile. 0: Log is not output. 1: Level where a log is recorded mainly at a time of error
Country	Country Code For different country business operation, the ASCII character portion of country code can be set. Select the best character of each country. 112 China Can be set in Control Panel
BatteryModeBrightness	Specifies the Line Display Backlight Brightness to be set when POS terminal switch to DC (Battery Mode). Default value: 60 Valid value range: 0 to 100

LIUST-C10BICN Line Display Control Registry

3.8. About Log recording

This control support limited log recording function. The log file path is describe in the "DebugLogFile" entry in the registry, and the log level is describe by "DebugLogLevel" entry.

The format of the log is : Date,Time,[Method Name],Information,ApplicationName. Below is the sample of the log:

```
2009/12/07,11:12:58.604,[CLineDisplay::OpenSe]>>> Start: DeviceName=LIUST-C10BI (C:\TEST.exe)
2009/12/07,11:12:58.620,[CLineDisplay::OpenSe]<<< End: Open service success!(C:\TEST.exe)
```

3.9. Battery Support

There are several occasion that the [BatteryModeBrightness] registry will take effect:

a) [Enable] Property is set to [TRUE]

During [Enable] is set to [TRUE], driver will check the POS Terminal either in AC or DC (battery) mode. If it is in DC mode, then driver will set the backlight brightness according to the [BatteryModeBrightness] registry value. Otherwise, driver will set Line Display backlight brightness base on [DeviceBrightness] property.

b) Wake up from Suspend Mode

When POS Terminal wake up from suspend mode, driver will check the POS Terminal either in AC or DC (battery) mode. If it is in DC mode, then driver will set the backlight brightness according to the [BatteryModeBrightness] registry value. Otherwise, driver will set Line Display backlight brightness base on [DeviceBrightness] property.

c) Power Status Change

Driver will capture power status change message from operation system, either from AC to DC or DC to AC. And driver checks the POS Terminal either in AC or DC (battery) mode. If it is in DC mode, then driver will set the backlight brightness according to the [BatteryModeBrightness] registry value. Otherwise, driver will set Line Display backlight brightness base on [DeviceBrightness] property.

Notification:

Application can set Line Display backlight brightness via OPOS Driver properties [DeviceBrightness]. During AC mode, if the application set [DeviceBrightness] property, this value will be stored. If POS Terminal goes into DC mode and backs to AC mode again, this value will be set back to Line Display. Meanwhile, if application set [DeviceBrightness] property during DC mode, despite of the value which had been set during AC mode, this value will be stored as the latest value.

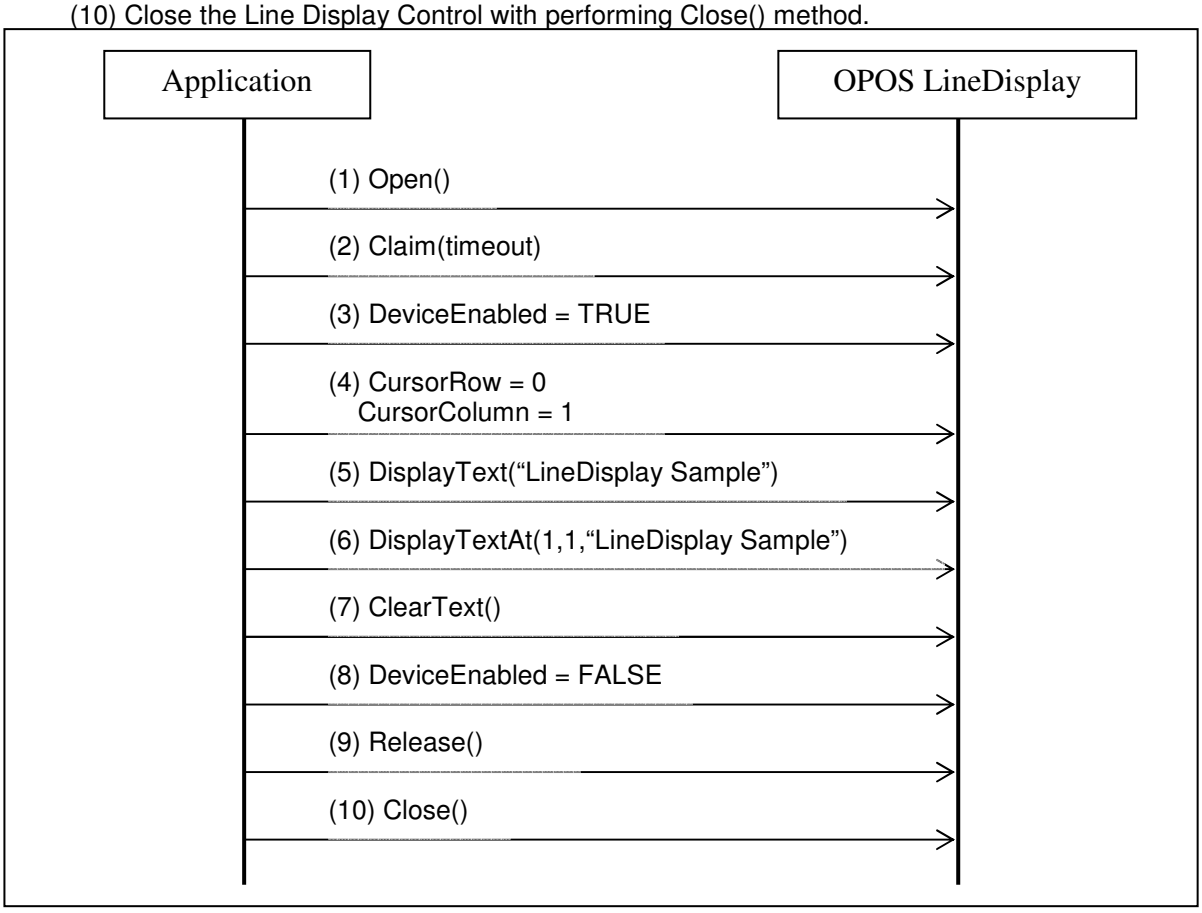
For example, if application set [DeviceBrightness] property to 80 during AC mode, then machine switch to DC mode. First, driver will set the line display backlight brightness base on "batteryModeBrightness" since it is in DC mode. If application set the [DeviceBrightness] property to 100 during this stage, driver will set the [DeviceBrightness] property to 100 if the machine switches from DC mode to AC mode instead of 80.

3.10. Usage

Explains the usage of a function as below.

Displays the characters & Eliminates the characters

(1) Open the Line Display Control with performing Open() method.
(2) Claim the Line Display Control with performing Claim(timeout) method.
(3) Enable the Line Display Control with performing DeviceEnabled property equals True.
(4) Determine the Cursor position with setting as CursorRow property equals 0 and CursorColumn property equals 1.
(5) Displays the string at cursor position with performing DisplayText("LineDisplay Sample")
(6) Displays the second string from the second row with performing DisplayTextAt(1, 1,"LineDisplay Sample")
(7) Eliminates the all character in window with performing ClearText() method.
(8) Disable the Line Display Control with performing DeviceEnabled property equals FALSE.
(9) Release the Line Display Control with performing Release() method.
(10) Close the Line Display Control with performing Close() method.



3.11. Result Code list of property modification and method execution

The list of the Result code name vs value:

ResultCode	Value
OPOS_SUCCESS	0
OPOS_E_CLOSED	101
OPOS_E_CLAIMED	102
OPOS_E_NOTCLAIMED	103
OPOS_E_NOSERVICE	104
OPOS_E_DISABLED	105
OPOS_E_ILLEGAL	106
OPOS_E_NOHARDWARE	107
OPOS_E_OFFLINE	108
OPOS_E_NOEXIST	109
OPOS_E_EXISTS	110
OPOS_E_FAILUER	111
OPOS_E_TIMEOUT	112
OPOS_E_BUSY	113
OPOS_E_EXTENDED	114

1) Result list with setting the properties.
There is the list of common result and specific result that valid properties.

Property name	ResultCode	Description	Countermeasures
Common	OPOS_SUCCESS	Succeeded in the setting of the property	-
	OPOS_E_CLOSED	Device control is closing	Reset this property after performing Open method
BinaryConversion	OPOS_E_ILLEGAL	It set the invalid value	Sets the valid value
DeviceEnabled	OPOS_E_NOTCLAIMED	Device is not claimed	Reset this property after performing Claim method
	OPOS_E_NOHARDWARE	Device is power off or device is not connected	Check the device power supply and the device connection
DeviceBrightness	OPOS_E_NOTCLAIMED	Device is not claimed	Reset this property after performing Claim method
	OPOS_E_DISABLED	Device is disabled	Reset this property after setting DeviceEnabled property true
	OPOS_E_ILLEGAL	It set the invalid value Out of range by 0 to 100.	Sets the valid value(0 to 100)
	OPOS_E_NOHARDWARE	Device is power off or device is not connected	Check the device power supply and the device connection
	OPOS_E_TIMEOUT	It is the communication timeout between device and terminal	Has to investigate the root causes
	OPOS_E_FAILURE	It is the communication error between device and terminal	Has to investigate the root causes

Property name	ResultCode	Description	Countermeasures
CharacterSet	OPOS_E_NOTCLAIMED	Device is not claimed	Reset this property after performing Claim method
	OPOS_E_DISABLED	Device is disabled	Reset this property after setting DeviceEnabled property true
	OPOS_E_ILLEGAL	It set the invalid value	Sets the valid value
CurrentWindow	OPOS_E_ILLEGAL	It set the invalid window value	Sets the valid value
CursorRow	OPOS_E_ILLEGAL	It set the invalid cursor row value	Sets the valid value
CursorColumn	OPOS_E_ILLEGAL	It set the invalid cursor column value	Sets the valid value

2) Result list with performing Open method.
* It notes separately from other methods. Because Open method is more special with comparing the other method.

Return value/ ResultCode	ResultCode	OpenResult	Description	Countermeasures
OPOS_SUCCESS	OPOS_SUCCESS	OPOS_SUCCESS	It has finished correctly.	-
OPOS_E_ILLEGAL	—	OPOS_OR_ALREADYOPEN	It has already opened	-
OPOS_E_NOEXIST	OPOS_E_CLOSED	OPOS_OR_REGBADNAME	Bad registry setting. There is not registry corresponding to the opening name.	Confirm the open name.
OPOS_E_NOEXIST	OPOS_E_CLOSED	OPOS_OR_REGPROGID	SO did not register correctly	Re-register the SO. If problem occur again, has to investigate the root causes.
OPOS_E_NOSERVICE	OPOS_E_CLOSED	OPOS_OR_CREATE	Failed to create the instance of SO	Re-install this control. If problem occur again, has to investigate the root causes.
OPOS_E_NOSERVICE	OPOS_E_CLOSED	OPOS_OR_BADIF	SO doesn't support mandatory method	Re-install this control. If problem occur again, has to investigate the root causes.
OPOS_E_NOSERVICE	OPOS_E_CLOSED	OPOS_OR_BADVERSION	SO version is not correct	Re-install this control. If problem occur again, has to investigate the root causes.
OPOS_E_ILLEGAL	OPOS_E_CLOSED	OPOS_OR_FAILEDOPEN	Failed to create the system resource	Has to investigate the root causes.
OPOS_E_NOEXIST	OPOS_E_CLOSED	OPOS_OR_FAILEDOPEN	Registry setting is not correct	Reset the registry Key. If problem occur again, has to investigate the root causes.
OPOS_E_NOSERVICE	OPOS_E_CLOSED	OPOS_OR_FAILEDOPEN	CO doesn't support mandatory method	Re-install this control. If problem occur again, has to investigate the root causes.

3) Result list with performing DirectIO method.

Command	Return value/ ResultCode	Description	Countermeasure
Common between commands	OPOS_SUCCESS	It has finished correctly	-
	OPOS_E_CLOSED	It is closed	call this method after performing Open method
	OPOS_E_ILLEGAL	Command parameter is illegal	Appoint the valid command
DISP_DIO_DIRECTOUTPUT	OPOS_E_NOTCLAIMED	Device is not claimed	Retry this method after performing Claim method
	OPOS_E_DISABLED	Device is disabled	Retry this method after setting DeviceEnabled property true
	OPOS_E_ILLEGAL	Memory cannot be allocated	Has to investigate the root causes.
	OPOS_E_NOHARDWARE	Device is power off or device is not connected	Check the device power supply and the device connection
	OPOS_E_TIMEOUT	It is the communication timeout between device and terminal	Has to investigate the root causes.
	OPOS_E_FAILURE	It is the communication error between device and terminal	Has to investigate the root causes.

4) Result list with performing method.
* Below is the result after performing the method except Open-DirectIO method.

Method	Return Value / ResultCode	Description	Countermeasure
Close	OPOS_SUCCESS	Device just disable, and it was closed.	-
	OPOS_E_CLOSED	It is already closed	-
	OPOS_E_ILLEGAL	CheckHealth method is performing in OPOS_CH_INTERACTIVE level	Retry this method after waiting the CheckHealth method finish.
Claim ClaimDevice	OPOS_SUCCESS	Device is just claimed	-
	OPOS_E_CLOSED	It is closed	Retry this method after performing Open method
	OPOS_E_CLAIMED	Device rejects the claim	Retry this method after releasing device by other application.
	OPOS_E_ILLEGAL	CheckHealth method is performing in OPOS_CH_INTERACTIVE level	Retry this method after waiting the CheckHealth method finish.
		Failed the start of the thread	Has to investigate the root causes.
		Invalid parameter was appointed when device was opened.	Has to investigate the root causes.
	OPOS_E_TIMEOUT	Timeout occurred when application waits device releasing by other application.	Retry this method after releasing device by other application.

Method	Return Value / ResultCode	Description	Countermeasure
Claim	OPOS_E_NOHARDWARE	Device is power off or device is not connected	Check the device power supply and the device connection
	OPOS_E_FAILUER	Error occurred when device was opened	Has to investigate the root causes.
Release ReleaseDevice	OPOS_SUCCESS	Device is released	-
	OPOS_E_CLOSED	It is closed	-
	OPOS_E_ILLEGAL	Application did not claim the device	-
		CheckHealth method is performing in OPOS_CH_INTERACTIVE level	Retry this method after waiting the CheckHealth method finish.
CheckHealth	OPOS_SUCCESS	CheckHealth could start correctly	-
	OPOS_E_CLOSED	It is closed	call this method after performing Open method
	OPOS_E_NOTCLAIMED	Device is not claimed	call this method after performing Claim method
	OPOS_E_DISABLED	Device is disabled	Retry this method after setting DeviceEnabled property true
	OPOS_E_ILLEGAL	Invalid CheckHealthLevel was appointed	Appoint the valid CheckHealth level
	OPOS_E_NOHARDWARE	Device is power off or device is not connected	Check the device power supply and the device connection
	OPOS_E_TIMEOUT	It is the communication timeout between device and terminal	Has to investigate the root causes.
	OPOS_E_FAILUER	It is the communication error between device and terminal	Has to investigate the root causes.
		NG button was appointed on OPOS_CH_INTERACTIVE dialogue.	-

Method	Return Value / ResultCode	Description	Countermeasure
ResetStatistics	OPOS_E_CLOSED	It is closed	-
	OPOS_E_NOSERVICE	This method is not support because of SO Version is too old	-
RetrieveStatistics	OPOS_E_CLOSED	It is closed	-
	OPOS_E_NOSERVICE	This method is not support because of SO Version is too old	-
UpdateStatistics	OPOS_E_CLOSED	It is closed	-
	OPOS_E_NOSERVICE	This method is not support because of SO Version is too old	-
DisplayText	OPOS_SUCCESS	It has finished correctly.	-
	OPOS_E_CLOSED	It is closed	call this method after performing Open method
	OPOS_E_NOTCLAIMED	Device is not claimed	call this method after performing Claim method
	OPOS_E_DISABLED	Device is disabled	Retry this method after setting DeviceEnabled property true
	OPOS_E_ILLEGAL	Invalid Attribute was appointed	Appoint the valid Attribute

Method	Return Value / ResultCode	Description	Countermeasure
DisplayText	OPOS_E_ILLEGAL	Memory cannot be allocated	Has to investigate the root causes.
	OPOS_E_NOHARDWARE	Device is power off or device is not connected	Check the device power supply and the device connection
	OPOS_E_TIMEOUT	It is the communication timeout between device and terminal	Has to investigate the root causes.
	OPOS_E_FAILUER	It is the communication error between device and terminal	Has to investigate the root causes.
DisplayTextAt	OPOS_SUCCESS	It has finished correctly.	-
	OPOS_E_CLOSED	It is closed	call this method after performing Open method
	OPOS_E_NOTCLAIMED	Device is not claimed	call this method after performing Claim method
	OPOS_E_DISABLED	Device is disabled	Retry this method after setting DeviceEnabled property true
	OPOS_E_ILLEGAL	Invalid Attribute was appointed	Appoint the valid Attribute
		Invalid Row/Column was appointed	Appoint the valid Row/Column
		Memory cannot be allocated	Has to investigate the root causes.

Method	Return Value / ResultCode	Description	Countermeasure
DisplayTextAt	OPOS_E_NOHARDWARE	Device is power off or device is not connected	Check the device power supply and the device connection
	OPOS_E_TIMEOUT	It is the communication timeout between device and terminal	Has to investigate the root causes.
	OPOS_E_FAILUER	It is the communication error between device and terminal	Has to investigate the root causes.
ClearText	OPOS_SUCCESS	It has finished correctly.	-
	OPOS_E_CLOSED	It is closed	call this method after performing Open method
	OPOS_E_NOTCLAIMED	Device is not claimed	call this method after performing Claim method
	OPOS_E_DISABLED	Device is disabled	Retry this method after setting DeviceEnabled property true
	OPOS_E_NOHARDWARE	Device is power off or device is not connected	Check the device power supply and the device connection
	OPOS_E_TIMEOUT	It is the communication timeout between device and terminal	Has to investigate the root causes.
	OPOS_E_FAILUER	It is the communication error between device and terminal	Has to investigate the root causes.
ScrollText	OPOS_SUCCESS	It has finished correctly.	-
	OPOS_E_CLOSED	It is closed	call this method after performing Open method

Method	Return Value / ResultCode	Description	Countermeasure
ScrollText	OPOS_E_NOTCLAIMED	Device is not claimed	call this method after performing Claim method
	OPOS_E_DISABLED	Device is disabled	Retry this method after setting DeviceEnabled property true
	OPOS_E_ILLEGAL	Invalid Direction was appointed	Appoint the valid Direction
	OPOS_E_NOHARDWARE	Device is power off or device is not connected	Check the device power supply and the device connection
	OPOS_E_TIMEOUT	It is the communication timeout between device and terminal	Has to investigate the root causes.
	OPOS_E_FAILUER	It is the communication error between device and terminal	Has to investigate the root causes.
SetDescriptor	OPOS_SUCCESS	It has finished correctly.	-
	OPOS_E_CLOSED	It is closed	call this method after performing Open method
	OPOS_E_NOTCLAIMED	Device is not claimed	call this method after performing Claim method
SetDescriptor	OPOS_E_DISABLED	Device is disabled	Retry this method after setting DeviceEnabled property true
	OPOS_E_ILLEGAL	Invalid Descriptor was appointed	Appoint the valid Descriptor

Method	Return Value / ResultCode	Description	Countermeasure
SetDescriptor	OPOS_E_ILLEGAL	Invalid Attribute was appointed	Appoint the valid Attribute
	OPOS_E_NOHARDWARE	Device is power off or device is not connected	Check the device power supply and the device connection
	OPOS_E_TIMEOUT	It is the communication timeout between device and terminal	Has to investigate the root causes.
	OPOS_E_FAILUER	It is the communication error between device and terminal	Has to investigate the root causes.
ClearDescriptors	OPOS_SUCCESS	It has finished correctly.	-
	OPOS_E_CLOSED	It is closed	call this method after performing Open method
	OPOS_E_NOTCLAIMED	Device is not claimed	call this method after performing Claim method
	OPOS_E_DISABLED	Device is disabled	Retry this method after setting DeviceEnabled property true
	OPOS_E_NOHARDWARE	Device is power off or device is not connected	Check the device power supply and the device connection
	OPOS_E_TIMEOUT	It is the communication timeout between device and terminal	Has to investigate the root causes.
	OPOS_E_FAILUER	It is the communication error between device and terminal	Has to investigate the root causes.
CreateWindow	OPOS_SUCCESS	It has finished correctly.	-
	OPOS_E_CLOSED	It is closed	call this method after performing Open method
	OPOS_E_NOTCLAIMED	Device is not claimed	call this method after performing Claim method

Method	Return Value / ResultCode	Description	Countermeasure
CreateWindow	OPOS_E_DISABLED	Device is disabled	Retry this method after setting DeviceEnabled property true
	OPOS_E_ILLEGAL	Invalid parameter was appointed	Appoint the valid parameter
		Memory cannot be allocated	Has to investigate the root causes.
DestroyWindow	OPOS_SUCCESS	It has finished correctly.	-
	OPOS_E_CLOSED	It is closed	call this method after performing Open method
	OPOS_E_NOTCLAIMED	Device is not claimed	call this method after performing Claim method
	OPOS_E_DISABLED	Device is disabled	Retry this method after setting DeviceEnabled property true
	OPOS_E_ILLEGAL	Window Number equals 0, this window cannot be deleted.	Retry this method after setting CurrentWindow property besides 0.
		Information of current window couldn't be got.	Has to investigate the root causes.
RefreshWindow	OPOS_SUCCESS	It has finished correctly.	-
	OPOS_E_CLOSED	It is closed	call this method after performing Open method
	OPOS_E_NOTCLAIMED	Device is not claimed	call this method after performing Claim method
	OPOS_E_DISABLED	Device is disabled	Retry this method after setting DeviceEnabled property true
	OPOS_E_ILLEGAL	Invalid Window was appointed	Appoint the valid Window
	OPOS_E_NOHARDWARE	Device is power off or device is not connected	Check the device power supply and the device connection

Method	Return Value / ResultCode	Description	Countermeasure
RefreshWindow	OPOS_E_TIMEOUT	It is the communication timeout between device and terminal	Has to investigate the root causes.
	OPOS_E_FAILUER	It is the communication error between device and terminal	Has to investigate the root causes.
ReadCharacterAtCursor	OPOS_E_CLOSED	It is closed	-
	OPOS_E_NOSERVICE	This method is not support because of SO Version is too old	-
DefineGlyph	OPOS_E_CLOSED	It is closed	-
	OPOS_E_NOSERVICE	This method is not support because of SO Version is too old	-
DisplayBitmap	OPOS_E_CLOSED	It is closed	-
	OPOS_E_NOSERVICE	This method is not support because of SO Version is too old	-
SetBitmap	OPOS_E_CLOSED	It is closed	-
	OPOS_E_NOSERVICE	This method is not support because of SO Version is too old	-