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EPSON OPOS ADK for .NET Manual

Application Development Guide

POSPrinter
(TM-H2000)

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Notes

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Trademarks

Contents

Chapter 1 Introduction

This manual includes explanations on how to use a POSPrinter with EPSON OPOS ADK for .NET, as well as related items and device-specific precautions.

For details on the POS for .NET API, refer to the "UnifiedPOS Retail Peripheral Architecture Version 1.14.1" specification and the MSDN "POS for .NET v1.14.1 SDK Documentation":

http://www.omg.org/retail/unified-pos.htm
https://msdn.microsoft.com/en-us/library/bb429024(v=winembedded.4).aspx

1.1 Terminology

- “UnifiedPOS Retail Peripheral Architecture Version 1.14.1” may be abbreviated as “UPOS”.
- “Microsoft POS for .NET” may be abbreviated as “POS.NET”.
- “EPSON OPOS ADK for .NET Version 1.14.6” may be abbreviated as “OPOS.NET”.
- “POSPrinter” and “printer” may be referred to as “device”.
- “ServiceObject of POSPrinter provided by OPOS.NET” may be abbreviated as “ServiceObject”.
- “ErrorCode properties of PosControlException” may be abbreviated as “ErrorCode”.
- “ErrorCodeExtended properties of PosControlException” may be abbreviated as “ErrorCodeExtended”.
- “**JrnLineChars**”, “**RecLineChars**”, “**SlpLineChars**”, and other properties defined commonly for stations may appear as “***Stn***”. For example, “*Stn*LineChars” character strings for indicating stations.
- “Exception” indicates “PosControlException”.
- The EPSON original device constant used with this device is defined in “jp.co.epson.uposcommon.EpsonUPOSConst” and “jp.co.epson.uposcommon.EpsonPOSPrinterConst”.
- Inch: 1 inch is 25.4 mm.
- “dpi” is the number of dots per inch.

- The language specification of the device may be indicated as follows.
  ANK specification: Device without multi-byte characters
  JP specification: Japanese compatible device
- Wired LANs and wireless LANs may be referred to as networks.
- A “receipt”, “journal”, or “slip” indicates either a station or paper depending on the context.
- NVRAM indicates non-volatile random access memory.

Chapter 2 Before Using POSPrinter

This chapter includes explanations on how to set up a POSPrinter, as well as precautions and restrictions on use.

2.1 Device Setup

After checking the model and settings of the hardware, use the SetupPOS utility to select the correct device. For details on how to configure hardware, refer to "Hardware Settings" for each device in "Appendix-C Hardware Settings". For details on how to use the SetupPOS utility, refer to the User's Reference Guide and "Appendix-B SetupPOS Settings".

2.2 Command execution during offline

The command execution during offline function enables, insofar as is possible, processes to be executed even when the printer is offline due to cover open, no paper, or other condition.
When either the receipt station or the slip station is in an unusable state, this function makes possible to control the other station.
Even when both the receipt station and the slip station are unusable, operations such as logo registration in the nonvolatile area of the device can be performed.
This function is set using the TM-H2000 utility. For details, refer to "TM-H2000 Utility User's Manual".

The timing of notification of the power status by **StatusUpdateEvent**, and the timing at which the ServiceObject updates the **PowerState** property vary depending on whether this function is enabled or disabled.
Details are as follows:

Printer status	Event when disabled	Event when enabled
Cover open	OFF_OFFLINE or OFFLINE notification	No notification
Cover closed	ONLINE notification	No notification
Out of receipt paper	OFF_OFFLINE or OFFLINE notification	No notification
Cover closed after receipt paper is loaded	ONLINE notification	No notification

If the printer status changes when this function is enabled, notification of a **StatusUpdateEvent** will not take place and the **PowerState** property will not change. For this reason, it is not possible to check if the printer method is executable by checking **StatusUpdateEvent** or the **PowerState** property.
To check if the printer method is executable,
PTR_DI_GET_OFFLINE_CONDITION of the **DirectIO** method can be used.
For details on the **DirectIO** method, refer to “3.2.5 DirectIO Method” in this manual.

2.3 Precautions and Restrictions

- Only DTR/DSR device flow control is supported.
- If you turn the device off and then on or open the cover during printing, unnecessary data may be printed.
- Wait at least five seconds after the device has been turned off before turning it back on.
- Using ESC|#E to send data may hinder the subsequent operations of the ServiceObject or cause an unexpected result because the sent data is not checked by ServiceObject.
- Sending a print control command is not recommended. Careful consideration is required before sending such a command.
- Any character code (Unicode) expressed in the string type is converted to a byte code based on the value set in the **CharacterSet** property. Be careful if you want to specify the extended ASCII code for byte code conversion.
- All properties and parameters of a method affected by the **MapMode** property are processed by “dot”. Therefore, when the **MapMode** property is other than MapMode.Dots, an error of ±1 may be produced in the property and the parameter of the method affected by the **MapMode** property.
- Only a value described in the ***Stn*LineCharsList** property can be set in the ***Stn*LineChars** property. If a value other than a value described in the ***Stn*LineCharsList** property is set, the value is set to the nearest value that is smaller in the ***Stn*LineCharsList** property. However, an exception is thrown if a value larger than the largest value described in the ***Stn*LineCharsList** property is set.
- If 254 or 255 is specified in the **CharacterSet** property and PTR_DI_NONE is the specification of the PTR_DI_BINARY_CONVERSION command of the **DirectIO** method, the Unicode encoding name becomes the system default encoding name.

- If the paper is ejected before the printing of a slip is complete, any data that was not printed is deleted. If this happens, the slip station selection is canceled.
- When printing onto a slip in rotated 90-degree print mode, emphasis print is unavailable.
- When printing onto a slip in the PageModePrint mode, emphasis print is unavailable.
- When NVRAM is used by the **SetBitmap** method, no consideration is given to other applications saving images to NVRAM.
- The device has a limit for the number of times the write to NVRAM operation can be performed. Try your utmost to avoid programming that involves using the **SetBitmap** method and **DirectIO** method for repeated saving and deleting because the write to NVRAM operation is performed when saving and deleting an image.
- The capacity of NVRAM for storing images differs depending on the settings of the device. Be extremely careful when replacing devices because the capacity of NVRAM for storing images is not considered at the ServiceObject.

Chapter 3 Properties, Methods, and Events

3.1 Properties

The properties listed below differ from functions described in UPOS.

3.1.1 CapPowerReporting Property

Description

Identifies the reporting capabilities of the device.
One of the following values is set.

Value	Meaning
PowerReporting.Standard	"Communication compatibility" is enabled in a USB connection, or the value set when a serial connection is established. ServiceObject can determine and report two of the power states: OFF_OFFLINE (the device is off or offline) and ONLINE.
PowerReporting.Advanced	"Communication compatibility" is disabled in a USB connection, or the value set when a parallel, USB and network connection is established. ServiceObject can determine and report three of the power states: OFF, OFFLINE, and ONLINE.

3.1.2 CapCharacterSet Property

Description

This property is initialized by the **Open** method according to the “Multi Byte Character Type” setting of SetupPOS. However, after the **Claim** method is executed, the value may be changed depending on the actual language of the device.
One of the following values is set.

Value	Meaning
CharacterSetCapability.Unicode	Able to print the equivalent to a Unicode character, within the limits of the printable characters of the device.

3.1.3 CapSlpBold Property

Description

Emphasis printing is not performed in rotated 90-degree print mode even if this property is true in the slip station.

3.1.4 CharacterSet Property

Description

Only a value in the **CharacterSetList** property can be set.
If the value of the property is set to 932, the print character for the ASCII code 0x5C is changed to the yen mark (¥).
The property is initialized to one of the following values.

Value	Meaning
CharacterSetUnicode(997)	Print an equivalent Unicode character, within the limits of the printable characters of the device.

This property is initialized by the **Open** method according to the SetupPOS setting "CharacterSet".
After the **Claim** method is executed, the value may be changed depending on the actual language specification of the device.

The same Unicode code point is assigned to some characters which are

defined in both the device Kanji and non-Kanji character tables.

e.g.:
U+0391(Greek Capital Letter Alpha)
CharacterSet 932(Shift-JIS) 0x839F
CharacterSet 737(Greek) 0x80

If the CharacterSet property is set to 997 or 932, data will be printed using the Kanji font.
To print a single-byte character, please set the CharacterSet property to 737.

3.1.5 CharacterSetList Property

Description

This property is initialized by the **Open** method according to the “Multi Byte Character Type” setting of SetupPOS.
However, after the **Claim** method is executed, the value may be changed depending on the actual language specification of the device.

3.1.6 MapMode Property

Description

All properties and parameters of a method affected by the **MapMode** property are processed by “dot”.
When the **MapMode** property is other than MapMode.Dots, an error of ±1 may be produced in the property and the parameter of the method affected by the **MapMode** property.

3.1.7 *Stn*LineChars Property

Description

Stn of the property name corresponds to **Rec**, and **Slp**.
After the **Claim** method is executed, the value may be changed according to the specification of the device.
Only a value in the ***Stn*LineCharsList** property can be set.
If the value set is other than a value in the ***Stn*LineCharsList** property and is smaller than the maximum value supported by the printer, the value is set to a value that is larger and the nearest value in the ***Stn*LineCharsList** property.

3.1.8 *Stn*LineCharsList Property

Description

Stn of the property name corresponds to **Rec**, and **Slp**.
After the **Claim** method is executed, the value may be changed according to the specification of the device.

3.1.9 *Stn*LineSpacing Property

Description

Stn of the property name corresponds to **Rec**, and **Slp**.
A value smaller than the ***Stn*LineHeight** property can also be set. If a value smaller than the ***Stn*LineHeight** property is set, character strings in the first and second lines overlap when printed. However, the characters strings do not overlap when printing on a thermal station or in rotated 90-degree print mode.

3.1.10 *Stn*LineWidth Property

Description

Stn of the property name corresponds to **Rec**, and **Slp**.
After the **Claim** method is executed, the value may be changed according to the specification of the device.

3.1.11 *Stn*LetterQuality Property

Description

Stn of the property name corresponds to **Rec**, and **Slp**.
When this property is changed, other properties, such as printing resolution and control method of the head are changed.
They vary depending on the head type of the station.
However, changing the printing resolution does not change the values of properties such as ***Stn*LineWidth** and ***Stn*LineSpacing**.

Station	Description of Change
Receipt	Setting/canceling of smoothing of double height/width characters. Changing of printing resolution.
Slip	Specifying/canceling of unidirectional printing.

3.1.12 *Stn*SidewaysMaxLines Property

Description

After the **Claim** method is executed, the value may be changed according to the specification of the device.

3.1.13 SlpLinesNearEndToEnd Property

Description

This property is always set to 0.

3.1.14 SlpMaxLines Property

Description

If the PTR_DI_SELECT_SLIP command of the **DirectIO** method is used to select a slip, the value of this property changes.

3.1.15 DeviceEnabled property

Description

When the Device Enabled property is set to TRUE first after the **Claim** method is executed, device initialization is performed.

In the following states, device initialization cannot be done:

- Offline (e.g. Cover open, out of paper, etc.)
- Error (e.g. Paper jam)

When the **DeviceEnabled** property is set to TRUE, the printer state is notified via a **StatusUpdateEvent**.
If the **StatusUpdateEvent** for the printer stat is not defined in UPOS, however, the **StatusUpdateEvent** cannot be notified. In this case, the printer status can be found by examining the exception that is notified when the method is executed.

If the device initialization cannot be done when the **DeviceEnabled** property is set to TRUE, a device status is checked at an interval of 1 second, and it is repeated until the device initialization is performed completely. The device initialization status can be found by enabling the **PowerNotify** property.When StatusPowerOnline is notified by a StatusUpdateEvent, the initialization process is complete.
In addition, the initialization process may take several seconds depending on the connection speed and the image registration status.

3.2 Methods

The methods listed below differ from functions described in UPOS.

3.2.1 Claim Method

Description

The device connection state is confirmed. If the device is not connected, or if the power is OFF, an exception is thrown. In the case of a Serial connection, the device connection state cannot be confirmed. In this case, Success is always returned. In the case of a USB connection where the "Port Name Type" is set to "Device Name", if the printer is in an error state, an exception is thrown.

3.2.2 Release Method

Description

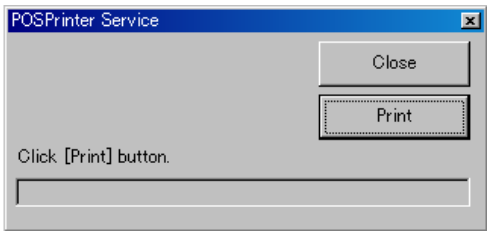
The connection is disconnected at the port where the device is connected.

3.2.3 CheckHealth Method

Description All functions of the **CheckHealth** method are supported.

Level	Outline of Function
HealthCheckLevel.Internal	The state of the device is checked based on the information held in the current ServiceObject (no action is taken on the device).
HealthCheckLevel.External	A test print of the following character strings is performed on the station selected currently. External HCheck !! EPSON UPOS ADK ServiceVersion=version of the ServiceObject DeviceName=device name

HealthCheckLevel.Interactive The following dialog box appears.



Press the Print button to perform the test.
A test print of the following character strings is performed on the station currently selected.

- Interactive HCheck !!
- EPSON UPOS ADK
- ServiceVersion=version of the ServiceObject
- DeviceName=device name

Press the Close button to end the test.

The results are stored in the **CheckHealthText** property.
And besides, the following value is retrieved as the returned value of method.

level	Value	Meaning
HealthCheckLevel.Internal		
	Internal HCheck: Successful	The **CheckHealth** method finished normally.
	Internal HCheck: Error-<Message>	The **CheckHealth** method finished with an error. The Message contains error information.

HealthCheckLevel.External

External HCheck: Successful	The **CheckHealth** method finished normally.
External HCheck: Error-<Message>	The **CheckHealth** method finished with an error. The Message contains error information.

HealthCheckLevel.Interactive

Interactive HCheck: Canceled	The **CheckHealth** method finished without doing anything.
Interactive HCheck: Complete	After the last operation ended normally, the **CheckHealth** method finished.
Interactive HCheck: Error-<Message>	After the last operation finished with an error, the **CheckHealth** method finished. The Message contains error information.

3.2.4 ClearOutput Method

Description

In asynchronous mode, only output data that is non-transmitted transaction data is deleted. Therefore, data in the current transmission and data sent to the device but not printed is not deleted.

3.2.5 DirectIO Method

Description

This method can be used when the **DeviceEnabled** property is true.
The **DirectIO** method supports the following functions.

command	Outline of Function
PTR_DI_OUTPUT_NORMAL	Sends the specified code to the device using flow control.
PTR_DI_OUTPUT_REALTIME	Sends the specified code to the device without using flow control.
PTR_DI_PANEL_SWITCH	Enables/disables the panel switch.
PTR_DI_RECOVER_ERROR	Recovers from a recoverable error.
PTR_DI_DELETE_NVIMAGE	Deletes the bitmap saved to NVRAM.
PTR_DI_CODE128_TYPE	Specifies the default code for Code128.
PTR_DI_BINARY_CONVERSION	Specifies the character string format specified in the parameter of the string type.
PTR_DI_HARDWARE_RESET	Resets the device.
PTR_DI_PRINT_FRANKING	Prints by franking.
PTR_DI_GET_OFFLINE_CONDITION	Acquires the printer status.

- **PTR_DI_OUTPUT_NORMAL Command**

Parameter

command	PTR_DI_OUTPUT_NORMAL
data	Not used
object(byte[]type)	Transmission data

Description

Sends data specified by the *object* parameter to the device directly using flow control.
Use this command only when sending an ESC/POS command to the device.
The ServiceObject does not check data sent by this command. Do not send ESC/POS commands that change the line feed amount or font size, since doing so will hinder the subsequent operations of the ServiceObject.

- **PTR_DI_OUTPUT_REALTIME Command**

Parameter

command	PTR_DI_OUTPUT_ REALTIME
data	Not used
object(byte[]type)	Transmission data

Description

Sends data specified by the *object* parameter to the device directly without using flow control. Use this command only when sending a real-time ESC/POS command to the device.
As this command is sent without using flow control, garbled printing may occur if there is any unsent data in the ServiceObject.

- **PTR_DI_PANEL_SWITCH Command**

Parameter

command	PTR_DI_PANEL_SWITCH
data	Specify ON/OFF (0 is OFF and 1 is ON)
object	Not used

Description

Enables/disables the panel switch.

The panel switch is enabled if *data* is set to ON (1) and disabled if *data* is set to OFF (0).

Depending on the type of device, there may be exceptions such as the following.

- During switch standby when a macro is being executed, the switch is enabled regardless of the setting.
- When the cover is open, the switch is disabled regardless of the setting.

- **PTR_DI_RECOVER_ERROR Command**

Parameter

command	PTR_DI_RECOVER_ERROR
data	Not used
object	Not used

Description

Recovers from a recoverable error.

This command sends the error recovery command to the device without using flow control.

Do not use this command when the device is in a non-recoverable error state.

- **PTR_DI_DELETE_NVIMAGE Command**

Parameter

command	PTR_DI_DELETE_NVIMAGE
data	Specify the key code to delete
object	Not used

Description

Deletes the image of the key code specified for the *data* parameter from NVRAM.

Use the key code reported by the **DirectIOEvent** event when **SetBitmap** is executed. If the key code is specified by PTR_DI_DELETE_ALL, all the images saved to NVRAM are deleted.

If an image saved to NVRAM is deleted, the following information is also deleted.

- The image information of NVRAM on the PC.
- The registration information of the **SetBitmap** method associated with the key code to be deleted.

- **PTR_DI_CODE128_TYPE Command**

Parameter

command	PTR_DI_CODE128_TYPE
data	Specify one of the following. • PTR_DI_CODE_A • PTR_DI_CODE_B • PTR_DI_CODE_C
object	Not used

Description

Specifies the default code for the CODE128 barcode.

To print the CODE128 barcode, codes A, B, and C need to be specified at the beginning of the printing data. If they are not specified at the beginning of the printing data of the **PrintBarCode** method, use the code specified with this command to print the CODE128 barcode.

The default setting is PTR_DI_CODE_A.

- **PTR_DI_BINARY_CONVERSION Command**

Parameter

command	PTR_DI_BINARY_CONVERSION
data	Specify one of the following. • PTR_DI_BC_NONE • PTR_DI_BC_NIBBLE • PTR_DI_BC_DECIMAL
object	Not used

Description

Specifies the character string format specified in the parameter of the string type.
The specification is the same as that of the **BinaryConversion** property of OPOS.
Use this command for the printing of two dimensional codes and for a **CharacterSet** property for which Unicode specification is not possible.
The setting of this command is valid for the following methods.

- **PrintBarCode** method
- **PrintNormal** method (only when the **CharacterSet** property is a blank page [254, 255])
- **PrintImmediate** method (only when the **CharacterSet** property is a blank page [254, 255])

- **PTR_DI_HARDWARE_RESET Command**

Parameter

command	PTR_DI_HARDWARE_RESET
data	Not used
object	Not used

Description

Resets the device.
If this command is used, behavior of this software is the same as if the device has been turned off and then on.
This command cannot be used when there is a serial connection.

- **PTR_DI_PRINT_FRANKING Command**

Parameter

command	PTR_DI_PRINT_FRANKING
data	Not used
object	Not used

Description

Prints by Franking.
Franking is applied to slip station printing by this command.
After Franker printing is performed, the slip remains selected.
If data exists in the print buffer when this command is executed, Franker printing is performed after the data in the print buffer is printed.
If this method is executed while the slip station is not selected, an exception is thrown.

- **PTR_DI_GET_OFFLINE_CONDITION Command**

Parameter

command	PTR_DI_GET_OFFLINE_CONDITION
data	Not used
object	Not used

Description

Acquires the status of the currently connected printer from the device and stores the return value in the Data property of DirectIOData.
Constants that can be specified for the *Data* parameter are shown below.

data	**Meaning**
PTR_DI_CONDITION_ONLINE	Online
PTR_DI_CONDITION_RECEIPT_ONLY_OFFLINE	Receipt station is offline
PTR_DI_CONDITION_SLIP_ONLY_OFFLINE	Slip station is offline

PTR_DI_CONDITION_OFFLINE_EXECUTE	Receipt and slip stations are both offline; operations that do not involve printing can be executed.
PTR_DI_CONDITION_RECOVERBLE	Printer is in an error state; Recovery possible by recovery command.
PTR_DI_CONDITION_UNRECOVERBLE	Printer is in an error state; recovery only possible by rebooting the printer.

3.2.6 ResetStatistics Method

- **Parameter type: Microsoft.PointOfService.StatisticCategories**

Parameter	
Microsoft.PointOfService.StatisticCategories	Specify one of the following. • StatisticCategories.Upos • StatisticCategories.Manufacturer • StatisticCategories.All

Description

Of the items included in the specified category, only the items for which O appeared for the permission reset in “Appendix-F DeviceStatistics” are reset.

All the statistics supported by the ServiceObject are defined in UPOS. If “StatisticCategories.Manufacturer” is specified, nothing is reset.

- **Parameter type: *String[]***

Parameter	
String[]	An array of the item names to reset

Description

Of the items included in the specified category, only the items for which O appears for the reset permission in ”Appendix-F DeviceStatistics” are reset when “U_”, “M_”, or an empty string is specified for item names.

If an illegal item name or non-resettable item name is included, this method reports an error. When this happens, correctly specified items are also not reset.

All the statistics supported by the ServiceObject are defined in UPOS. If “M_” is specified, nothing is reset.

3.2.7 ResetStatistic Method

Description

Of the items included in the specified category, only the items for which O appears for the reset permission in ”Appendix-F DeviceStatistics” are reset when “U_”, “M_”, or an empty string is specified for item names.
If an illegal item name or non-resettable item name is specified, this method reports an error.
All the statistics supported by the ServiceObject are defined in UPOS. If “M_” is specified, nothing is reset.

3.2.8 RetrieveStatistics Method

- **Parameter type: Microsoft.PointOfService.StatisticCategories**

Parameter

Microsoft.PointOfService.StatisticCategories

Specify one of the following.
- StatisticCategories.Upos
- StatisticCategories.Manufacturer
- StatisticCategories.All

Description

The Statistics supported by ServiceObject are all defined in UPOS. If “StatisticCategories.Manufacturer” is specified, the minimum information specified by UPOS (the 4 items; UPOS version, manufacturer name, device name, and device category) is acquired.

- **Parameter type: *String[]***

Parameter	
String[]	An array of the item names to retrieve

Description

If an illegal item name is included, this method reports an error.
The Statistics supported by ServiceObject are all defined in UPOS. If “M_” is specified, the minimum information specified by UPOS (the 4 items; UPOS version, manufacturer name, device name, and device category) is acquired.

- **Parameter type: None**

Description

The information of all defined items is retrieved.

3.2.9 RetrieveStatistic Method

Description

If an illegal item name is included, this method reports an error.
If multiple item names separated by commas are specified (UPOS Specification), an error is reported.
The Statistics supported by ServiceObject are all defined in UPOS. If “M_” is specified, the minimum information specified by UPOS (the 4 items; UPOS version, manufacturer name, device name, and device category) is acquired.

3.2.10 UpdateStatistics Method

- **Parameter type: Microsoft.PointOfService.Statistic[]**

Parameter

Microsoft.PointOfService.Statistic[]

Specifies *Microsoft.PointOfService.Statistic* array for which item names and new values have been set.

Description

Of the items included in the specified category, only the items for which O appears for the update permission in ”Appendix-F DeviceStatistics” are updated when "U_", "M_", or an empty string is specified for item names.
If an illegal item name or non-updatable item name is included, this method reports an error. In this case, correctly specified items are also not updated.
The Statistics supported by ServiceObject are all defined by UPOS. If “M_” is specified, nothing is updated.

- **Parameter type: Microsoft.PointOfService.StatisticCategories**

Parameter	
Microsoft.PointOfService.StatisticCategories	Specify one of the following. • StatisticCategories.Upos • StatisticCategories.Manufacturer • StatisticCategories.All
Object	Specify the new value after updating.

Description

Of the items included in the specified category, only the items for which O appeared for the update permission in “Appendix-F DeviceStatistics” are updated.
All the statistics supported by the ServiceObject are defined in UPOS. If “StatisticCategories.Manufacturer” is specified, nothing is update.

3.2.11 UpdateStatistic Method

Description

Of the items included in the specified category, only the items for which O appears for the update permission in “Appendix-F DeviceStatistics” are updated when "U_", "M_", or an empty string is specified for item names.
If an illegal item name or non-updatable item name is specified, this method reports an error.
The Statistics supported by ServiceObject are all defined by UPOS. If “M_” is specified, nothing is updated.

3.2.12 BeginInsertion Method

Description

The slip station of devices supported by the ServiceObject cannot open the insertion opening for slips or enable paper insertion mode.
The **BeginInsertion** method checks whether there is a slip placed in the insertion opening of the slip station.

3.2.13 BeginRemoval Method

Description

When this method is executed, the slip paper is ejected. The device continues to wait until the slip is completely ejected from the device.
If the time of the *timeout* parameter elapses without the slip having been completely ejected from the device, an exception is thrown and the **ErrorCode** is ErrorCode.Timeout.

3.2.14 ChangePrintSide Method

Description

CapSlpBothSidesPrint property is false the exception is thrown.

3.2.15 MarkFeed Method

Description

CapRecMarkFeed property is PrinterMarkFeeds.None the exception of" there is no function" is thrown.

3.2.16 EndInsertion Method

Description

If this method is executed when a slip is placed in the insertion opening of the slip station, the slip is inserted into the device.
If no slip has been placed, an exception is thrown.
If the slip is not successfully inserted into the device within 10 seconds from the start of insertion, an exception is thrown.

3.2.17 EndRemoval Method

Description

An exception is thrown if the slip station is in a selected state.
The selected state of a slip station refers to the following states.

- A slip is inserted in the slip station.
- A slip is being inserted.
- A slip is being ejected or has been ejected but is not completely removed from the device.
- A slip is placed in the slip station.

3.2.18 CutPaper Method

Description

If the *percentage* parameter is 0, the method process ends without sending the command. If the *percentage* parameter is from 1 to 100, activate the cutter to perform a partial cut leaving one point uncut.

3.2.19 PrintNormal Method

Description

Although the UPOS specification is such that an error is generated during synchronous printing if there is no line feed code, printing is successful when this method is executed even if a character string contains no line feed code. See the table “Appendix-E Escape Sequences” for escape sequences supported by this device.

3.2.20 PrintImmediate Method

Description

Although “this method tries to print its data immediately – that is, as the very next printer operation” is written in the UPOS, with ServiceObject, the data of multiple transactions may be sent to the device during asynchronous printing. Therefore, data of the **PrintImmediate** method may not be printed immediately.

Although the UPOS specification is such that an error is generated during synchronous printing if there is no line feed code, printing is successful when this method is executed even if a character string contains no line feed code.

See the table “Appendix-E Escape Sequences” for escape sequences supported by this device.

3.2.21 PrintTwoNormal Method

Description

CapConcurrentRecSlp property is false the exception is thrown.

3.2.22 RotatePrint Method

Description

An exception is thrown for each of the following conditions, so the following method cannot be used.

Rotation	Methods	Mode
PrintRotation.Right90	**CutPaper**	Rotated 90-degree print
PrintRotation.Left90	Same as above	Same as above

When ESC|#B is used to print an image, rotated printing takes places regardless of the PrintRotation.Bitmap specification of the *rotation* parameter.

In the case of rotated 90-degree print mode, the following escape sequences are ignored even if the device supports the functions.

- ESC | P
- ESC | fP
- ESC | sP
- ESC | sL
- ESC | #rF
- ESC | cA
- ESC | rA

The *alignment* parameter of each of the **SetBitmap** method, **PrintBitmap** method, **PrintMemoryBitmap** method, and **PrintBarCode** method is also ignored.

If the current print mode is PageMode print, it is not possible to switch to rotated 90-degree print mode or rotated 180-degree print mode.

If an exception is thrown when this method is called, the rotated print mode is not switched.

In the case of rotated 90-degree print mode, buffering data saved to the ServiceObject is not cleared.

3.2.23 PrintBarCode Method

Description

Although both of the following affect rotated printing, settings made with the **RotatePrint** method take priority.
In other words, the **RotateSpecial** property setting is ignored when rotated printing of barcodes is specified with the **RotatePrint** method.

- **RotatePrint** method (specify PrintRotation.Barcode for the *rotation* parameter)
- **RotateSpecial** property

In the case of rotated 90-degree printing, operation differs depending on whether data buffering is performed. For details, refer to UPOS.

The following types of barcode can be printed using the **PrintBarCode** method.

- CODE128
- CODE128 Parsed
- CODE93
- CODABAR
- ITF
- CODE39
- JAN13 (EAN13)
- JAN8 (EAN8)
- UPC-E
- UPC-A
- PDF417
- QR Code
- GS1-DataBar
- GS1-DataBar 128
- GS1-DataBar Expanded
- GS1-DataBar Stacked Omnidirectional
- GS1-DataBar Expanded Stacked
- OTHER + 3 (QR Code model1)
- OTHER + 4 (QR Code model2)
- OTHER + 5 (GS1-Data Truncated)
- OTHER + 6 (GS1-Data Limited)
- OTHER + 7 (GS1-Data Stacked)

- OTHER + 8 (GS1-Data Stacked Omnidirectional)
- OTHER + 9 (GS1-Data Expanded Stacked)
- 13172839 (PDF417, EAN-8)
- 13172840 (PDF417, EAN-13)
- 13172837 (PDF417, UPC-A)
- 13172838 (PDF417, UPC-E)
- 13172867 (PDF417, GS1-DataBar)
- 13173242 (PDF417, GS1-DataBar Truncated)
- 13173244 (PDF417, GS1-DataBar Stacked)
- 13173245 (PDF417, GS1-DataBar Stacked Omnidirectional)
- 13172869 (PDF417, GS1-DataBar Stacked Omnidirectional)
- 13173243 (PDF417, GS1-DataBar Limited)
- 13172868 (PDF417, GS1-DataBar Expanded)
- 13173246 (PDF417, GS1-DataBar Expanded Stacked)
- 13172870 (PDF417, GS1-DataBar Expanded Stacked)
- 13172856 (PDF417, GS1-DataBar 128)

If this method is executed while the slip station is selected, an exception is thrown

Rotated 90-degree print mode cannot be used for printing of PDF417.

The printable conditions of PDF417 are as follows:

- TM-H2000 is printable only to the receipt with all specification.

3.2.24 PrintBitmap Method

Description

This method enables a jpeg file, gif file, or Windows bmp file to be specified.

The resolutions for printing images are as follows.

Station	Landscape	Portrait
Receipt	203 dpi	203 dpi
Slip	80 dpi	72 dpi

The resolutions for landscape and portrait are opposite when printing in rotated 90-degree print mode.

When printing an image onto a slip in rotated 90-degree print mode and configuring the settings as follows, the size of the printed image will differ from the size of an image printed in a mode other than the rotated

90-degree print mode (because of the relationship between the vertical and horizontal resolution).

- When the *width* parameter is PrinterBitmap.Asis
- When the **MapMode** property is MapMode.Dots

3.2.25 PrintMemoryBitmap Method

Description

Only bitmaps created from jpeg files, gif files, or Windows bmp files are supported. The resolutions for printing images are as follows.

Station	Landscape	Portrait
Receipt	203 dpi	203 dpi
Slip	80 dpi	72 dpi

The resolutions for landscape and portrait are opposite when printing in rotated 90-degree print mode. When printing an image onto a slip in rotated 90-degree print mode and configuring the settings as follows, the size of the printed image will differ from the size of an image printed in a mode other than the rotated 90-degree print mode (because of the relationship between the vertical and horizontal resolution).

- When the *width* parameter is PrinterBitmap.Asis
- When the **MapMode** property is MapMode.Dots

3.2.26 SetBitmap Method

Description

This method enables a jpeg file, gif file, and bmp file to be specified. For the resolutions for printing images, refer to the **PrintBitmap** method. This device can download images to non-volatile memory and volatile memory. Use SetupPOS to set whether to download to non-volatile memory. Only one image per station can be downloaded and saved to volatile memory. However, this method cannot be used when there are two print colors. The upper size limits for images that can be downloaded to the device are shown below. The following values are the upper limits for the command specification. Paper width or other factors may result in an exception being thrown even when an upper limit is not reached.

Volatile Memory:

Station	Number of Dots Wide	Number of Dots High	Total ((Number of Dots Wide ÷ 8) × (Number of Dots High ÷ 8))
Receipt	2040 dots	384 dots	1536 dots
Slip	2040 dots	2040 dots	512 dots

Non-volatile Memory:

Downloading can be performed until there is no longer any non-volatile memory available for storing images (memory capacity differs depending on the device settings). The size of memory used to store one image can be calculated as follows.

Size = ((number of dots wide + 7) ÷ 8) × number of dots high + 8 + (number of colors – 1)

When an image saved using the download function is printed onto a slip in rotated 90-degree print mode, the image is printed in landscape (because of the relationship between the vertical and horizontal resolution).

If this method is executed while the reverse side of a slip station is selected, an exception is thrown.

3.2.27 SetLogo Method

Description

The following escape sequences cannot be specified in data saved using this method. If they are specified, an exception is thrown.

- ESC | tL
- ESC | bL

3.2.28 TransactionPrint Method

Description

If the current rotated print mode is rotated 90-degree print mode, the mode cannot be switched to transaction mode. When switching out of transaction mode, any buffering data saved to the ServiceObject in rotated 90-degree print mode is printed and rotated 90-degree print mode is maintained. If an exception is thrown when this method is called, the transaction mode is not switched. Furthermore, buffering data saved to the ServiceObject while in transaction mode is not cleared.

3.2.29 PageModePrint Method

Description

Since an exception is thrown with the following conditions, the methods below cannot be used.

control	Methods	Mode
PageModePrintControl.PageMode	**CutPaper** **RotatePrint** **ChangePrintSide** (Setting the mode for PageMode printing of the slip station.)	PageModePrint

With PageMode printing, the following escape sequences are ignored even if the device supports the function.

・ESC | P
・ESC | fP
・ESC | sP
・ESC | sL
・ESC | #rF
・ESC | #E

If the current rotation print mode is rotated 90-degree print mode or rotated 180-degree print mode, it is not possible to switch to PageMode printing.

If, while in the transaction printing mode, either of the **PageModePrint** methods, PageModePrintControl.Normal or PageModePrintControl.PrintSave are executed, the PageMode printing data is buffered into the transaction printing buffer.

Properties related PageMode is initialized with following values only when it calls with DeviceEnabled=true for the first time.

・PageModePrintArea(0,0,0,0)

The values saved in this property is set when the page mode is started by PageModePrint method. Also, It is not initialized even if page mode printing is terminated by the PageModePrint method.

When this method is invoked and an exception is thrown, the PageMode

printing mode is not switched. In addition, with PageMode printing, data buffered in ServiceObject is not cleared.

3.3 Events

3.3.1 DirectIOEvent

The properties listed below differ from functions described in UPOS.

- **PTR_DIE_RESPONSE Event Number**

Property

EventNumber	PTR_DIE_RESPONSE
Data	0 (not used)
Object	Stores the response from the printer

Description

When the PTR_DI_OUTPUT_NORMAL or PTR_DI_OUTPUT_REALTIME command of the **DirectIO** method or the **PrintNormal** method/ **PrintImmediate** method involving ESC|#E results in the sending of an ESC/POS command that has a response from the device, the response is stored in the *Object* property and reported.
The ESC/POS commands capable of notification as a response are as follows.

- ESC u
- ESC v
- GS I (printer ID of 1 byte)
- GS r
- DLE EOT
- GS (C
- GS 8 L
- GS (L
- GS (G

- **PTR_DIE_SET_BITMAP_MODE Event Number**

Property	
EventNumber	PTR_DIE_SET_BITMAP_MODE
Data	Image save method
Object	Stores the key code

Description

Notifies of the save method used when the **SetBitmap** method saved an image.

One of the following values is set to the *Data* property.

Data	**Meaning**
PTR_DIE_MEMORY	Stored in the ServiceObject
PTR_DIE_VRAM	Stored in volatile memory of the printer
PTR_DIE_NVRAM	Stored in NVRAM of the printer

If the image saved by the **SetBitmap** method uses NVRAM, the key code used when saving to the *Object* property is stored.

3.3.2 ErrorEvent

Description

If the **DeviceEnabled** property becomes false while there is an **ErrorEvent** event queued state, the ServiceObject assumes that the *ErrorResponse* property has been set to ErrorResponse.Retry and performs the corresponding processing. Therefore, asynchronous output data is output again when the **DeviceEnabled** property becomes true. To prevent this data from being output again, execute the **ClearOutput** method.

Appendix-A Revision history

A.1 EPSON OPOS ADK for .NET 1.14.6

- Microsoft POS for .NET 1.14.1 is supported.

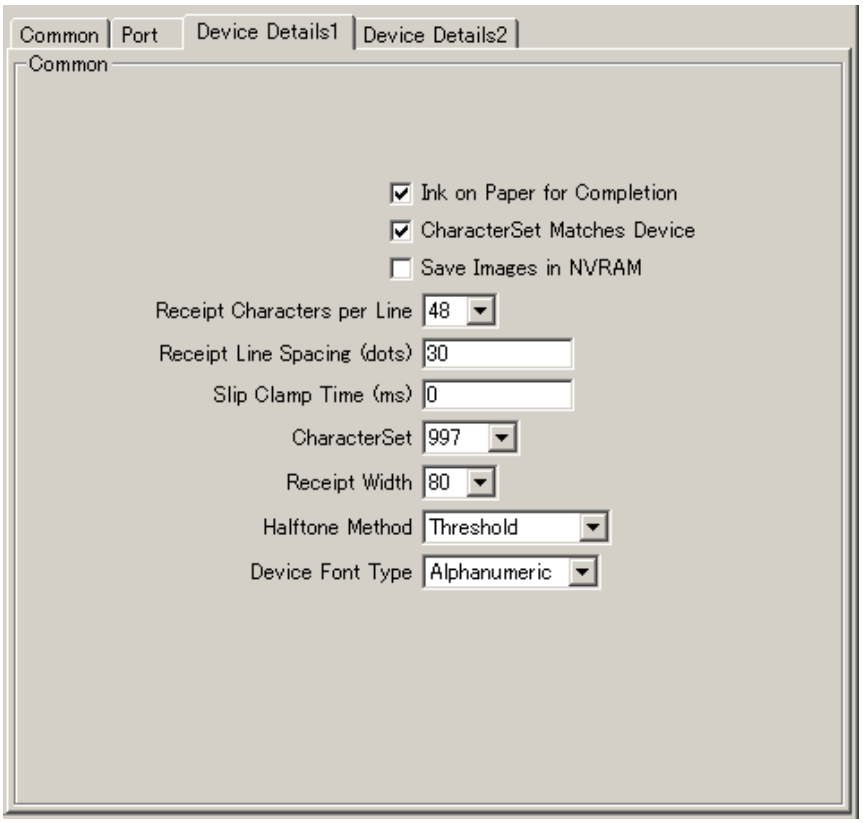
A.2 EPSON OPOS ADK for .NET 1.12

- Microsoft POS for .NET 1.12 is supported.
- Added response type issued by DirectIOEvnet.
- Added support for QR Code.

A.3 EPSON OPOS ADK for .NET 1.11.14

- New release

Appendix-B SetupPOS Settings



The settings for device details are divided into two tabs.

B.1 Verbose Error Codes Check Box

Description

Sets the error code type for during output.

State	Meaning
Checkmark added	Sets the timeout to ErrorCodeExtended for an error that occurs during output.
No checkmark added	Sets the printer state as is to ErrorCode or ErrorCodeExtended, regardless of whether the error occurred during output.

Default: no checkmark added

For some devices, this setting is only possible when there is either a parallel or a network connection.

B.2 Ink on Paper for Completion Check Box

Description

Sets whether to check that printing operation is complete.

State	Meaning
Checkmark added	Judges the printing method to be complete when the device completes printing.
No checkmark added	Judges the printing method to be complete when data output is complete.

- When set to judge method output to be complete when the device completes printing
  Printing on the device and the printing method are not completely synchronized. The method can be completed quickly.
  If the value of the **AsyncMode** property is set to true, the completion of printing is reported before the device actually completes printing because the **OutputCompleteEvent** event considers the printing method to be complete when the data output is complete.
  Printing is judged to be successful if method output completes even when an error was generated on the device during printing.

Default: checkmark added

B.3 CharacterSet Matches Device Check Box

Description

Sets whether the setting for the international character set is changed automatically to match the value of the **CharacterSet** property.

State	Meaning
Checkmark added	Sets the international character set to match the value of the **CharacterSet** property.
No checkmark added	Sets the international character set of America in the **CharacterSet** property.

Default: checkmark added

B.4 Save Images in NVRAM Check Box

Description

Sets whether the image specified when executing the **SetBitmap** method is saved to NVRAM of the device.

State	Meaning
Checkmark added	Saves the image to NVRAM of the device.
No checkmark added	Does not save the image to NVRAM of the device.

- When set to save the image to NVRAM of the device
  The saved image can even be printed if the application is restarted.
  The key code saved to the *Object* property of the **DirectIOEvent** event is set.

Default: no checkmark added

B.5 Receipt Characters per Line Combo Box

Description

Sets the default value for the number of characters on a line for receipt paper.

Item	Meaning
48	48 characters will be printed on one line.
64	64 characters will be printed on one line.

Default: 48

B.6 Receipt Line Spacing (dots) Text Box

Description

Sets the default value for the line spacing for receipt paper. Note that since the text cannot overlap for thermal printers, if this value is less than the value of the **RecLineHeight** property, the text will be printed using the value for the **RecLineHeight** property.

Value	Meaning
1 to 255	Receipt Line Spacing (units: dots) The spacing can be set in increments of 1 dot.

Default: 30

B.7 Slip Clamp Time (ms) Text Box

Description

Sets the time for the procedure from slip insertion (execution of **EndInsertion** method) to clamping.

Setting Value	Meaning
0 to 6400	Standby time (unit: ms) until clamping The time can be set in increments of 100 ms.

Default: 500 (ms)

B.8 CharacterSet Combo Box

Description

Set the initial value of the **CharacterSet** property. Select from a Character Set list depending on the setting of the **CharacterSetList** property. Selectable values change depending on the Device Font Type Combo Box setting.

Item	Meaning
997	All the printable characters installed on device can be assigned to Unicode and printed.
254,255,437,850,852, 858,860,863,865,866, 998,999,1252	Printed with the standard code page.

Default: 997

B.9 Receipt Width Combo Box

Description

Sets the receipt paper width.

Item	Meaning
58 mm	The receipt width is 58 mm.
80 mm	The receipt width is 80 mm.

Default: 80 mm

B.10 Halftone Method Combo Box

Description

Sets the halftone method type used during image printing (execution of **PrintBitmap** method).

Item	Meaning
Threshold	Uses the threshold method (monochrome conversion) on the specified image file, and then outputs it to the device.

Error Diffusion	Performs error diffusion processing on the specified image file, and then outputs it to the device.
Dithering	Performs dithering processing on the specified image file, and then outputs it to the device.

Default: Threshold

B.11 Device Font Type Combo Box

Description

Sets the multi-byte character font of the device.

Item	Meaning
None (ANK)	The device has no multi-byte character font.

Default: None (ANK)

B.12 Slip Reverse Eject Check Box

Description

Sets whether to change the eject direction of slips.

State	Meaning
Checkmark added	Ejects slips toward the front.
No checkmark added	Ejects slips toward the back.

- When set to eject slips toward the front
  When the **BeginRemoval** method is executed while a slip is set in the device, the slip can be ejected toward the front.

Default: no checkmark added

B.13 Endorse Multi Font Check Box

Description

Enables/disables multi-fonts for endorsements.

Setting Value	Meaning
Checked	Enables multi-fonts.
Not checked	Disables multi-fonts.

- When multi-font is enabled
  The character decoration function (multi-font) becomes available for endorsements. Multi-fonts that can be used are bold, tall, wide, tall/wide, and underline. Even if a multi-font other than these is specified, an error will not occur.

Default: checkmark added

B.14 Endorse Characters per Line Combo Box

Description

Sets the default value for the number of characters on a line for endorsement. The setting is changed by the Endorse Multi Font settings.

When multi-font is enabled

Item	Meaning
25	25 characters will be printed on one line.
33	33 characters will be printed on one line.

Default: 25

When multi-font is disabled

Item	Meaning
40	40 characters will be printed on one line.

Default: 40

B.15 Endorse Line Spacing (dots) Text Box

Description

Sets the default value for the line spacing for endorsement. The setting is changed by the Endorse Multi Font settings.

When multi-font is enabled

Item	Meaning
0 to 255	Endorsement Line Spacing (units: dots) The spacing can be set in increments of 1 dot.

Default: 12

When multi-font is disabled

Item	Meaning
10	Endorsement Line Spacing (units: dots)

Default: 10

Appendix-C Hardware Settings

- **DIP Switch Settings**

  Set the DIP switches of this device as shown below.

1) Serial connection

DIP-SW 1

No.	Setting	
1	OFF	Recommended
2	OFF	Fixed to OFF
3	OFF	Fixed to OFF
4	OFF	Fixed to OFF
5	OFF	Note 1
6	OFF	Note 1
7	ON	Note 2
8	OFF	Note 2

DIP-SW 2

No.	Setting	
1	OFF	Recommended
2	OFF	Note 3
3	OFF	Settable Note 4
4	OFF	Settable Note 4
5	OFF	Fixed to OFF
6	OFF	Fixed to OFF
7	OFF	Fixed to OFF
8	OFF	Fixed to OFF

Note 1: Set the parity with 5 and 6 of DIP-SW1.

DIP Switch 1 Parity Settings

SW No.	Function	ON	OFF	Default
1-5	Parity check	Parity	No parity	OFF
1-6	Parity selection	Even parity	Odd parity	OFF

Note 2: Set the transmission speed with 7 and 8 of DIP-SW1.

DIP Switch 1 Transmission Speed Switching

SW1-7	SW1-8	Baud Rate (bps)
ON	ON	4800
OFF	ON	9600
ON	OFF	19200
OFF	OFF	Note5

Note 3: Set the LineDisplay connection state with 2 of DIP-SW2.

Note 4: Set the printing density with 3 and 4 of DIP-SW2.

Note 5: This can be configured in the TM-H2000 Utility.

2) Parallel connection

DIP-SW 1

No.	Setting	
1	OFF	Recommended
2	OFF	Fixed to OFF
3	OFF	Fixed to OFF
4	OFF	Fixed to OFF
5	OFF	Fixed to OFF
6	OFF	Fixed to OFF
7	OFF	Fixed to OFF
8	OFF	Fixed to OFF

DIP-SW 2

No.	Setting	
1	ON	Fixed to ON
2	OFF	Fixed to OFF
3	OFF	Settable Note 1
4	OFF	Settable Note 1
5	OFF	Fixed to OFF
6	OFF	Fixed to OFF
7	OFF	Fixed to OFF
8	ON	Fixed to ON

Note 1: Set the printing density with 3 and 4 of DIP-SW2.

3) USB connection and Network connection

DIP-SW 1

No.	Setting	
1	OFF	Fixed to OFF
2	OFF	Fixed to OFF
3	OFF	Fixed to OFF
4	OFF	Fixed to OFF
5	OFF	Fixed to OFF
6	OFF	Fixed to OFF
7	OFF	Fixed to OFF
8	OFF	Fixed to OFF

DIP-SW 2

No.	Setting	
1	OFF	Recommended
2	OFF	Fixed to OFF
3	OFF	Settable Note 1
4	OFF	Settable Note 1
5	OFF	Fixed to OFF
6	OFF	Fixed to OFF
7	OFF	Fixed to OFF
8	ON	Fixed to ON

Note 1: Set the printing density with 3 and 4 of DIP-SW2.

- **Memory Switch Settings**

Set the memory switches of this device as shown below.

Mem-SW 1

No.	Setting	
1	ON	Note 1
2	-	
3	-	
4	-	
5	-	
6	-	
7	-	
8	-	

Mem-SW 8

No.	Setting	
1	-	
2	-	
3	OFF	Note 2
4	OFF	Note 2
5	-	
6	-	
7	OFF	Fixed to OFF Note 3
8	OFF	Fixed to OFF Note 3

Note 1: Set to ON for serial or Parallel connection, and set to OFF for network or USB connection.

Note 2: The setting is changed by the SetupPOS settings.

Note 3: The setting is fixed by the ServiceObject.

Appendix-D Default Values of Properties

- **Common Settings**

Property	Setting Value/Default Value	Range of Settings
CapCompareFirmwareVersion	false	—
CapPowerReporting	(Serial I/F) PowerReporting.Standard (Other I/F) PowerReporting.Advanced	—
CapStatisticsReporting	true	—
CapUpdateFirmware	false	—
CapUpdateStatistics	true	—
CheckHealthText	“”	—
Claimed	false	—
DeviceEnabled	false	true, false
OutputID	0	—
PowerNotify	PowerNotification.Disabled	PowerNotification.Disabled, PowerNotification.Enabled
PowerState	PowerState.Unknown	—
DeviceDescription	Refer to “Device Specific Property Settings”.	—
DeviceName	Refer to “Device Specific Property Settings”.	—
State	ControlState.Idle	—
AsyncMode	false	true, false
CapCharacterSet	Refer to “Settings Affecting Changing of Language”.	Refer to “Settings Affecting Changing of Language”.
CapConcurrentJrnRec	false	—
CapConcurrentJrnSlp	false	—
CapConcurrentRecSlp	false	—
CapConcurrentPageMode	false	—
CapCoverSensor	true	—
CapMapCharacterSet	false	—
CapTransaction	true	—
CartridgeNotify	PrinterCartridgeNotify.Disabled	—
CharacterSet	Refer to “Settings Affecting Changing of Language”.	Refer to “Settings Affecting Changing of Language”.
CharacterSetList	Refer to “Settings Affecting Changing of Language”.	Refer to “Settings Affecting Changing of Language”.
ErrorLevel	PrinterErrorLevel.None	—
ErrorStation	PrinterStation.None	—
ErrorString	“”	—
FlagWhenIdle	false	true, false
FontTypefaceList	“”	—
MapCharacterSet	false	—

MapMode	MapMode.Dots	MapMode.Dots, MapMode.Twips, MapMode.English, MapMode.Metric
PageModeArea	Refer to “Settings Related to PageMode”.	—
PageModeDescriptor	Refer to “Settings Related to PageMode”.	—
PageModeHorizontalPosition	Refer to “Settings Related to PageMode”.	Refer to “Settings Related to PageMode”.
PageModePrintArea	Refer to “Settings Related to PageMode”.	Refer to “Settings Related to PageMode”.
PageModePrintDirection	Refer to “Settings Related to PageMode”.	Refer to “Settings Related to PageMode”.
PageModeStation	PrinterStation.None	PrinterStation.Receipt, PrinterStation.Slip
PageModeVerticalPosition	Refer to “Settings Related to PageMode”.	Refer to “Settings Related to PageMode”.
RotateSpecial	PrintRotation.Normal	PrintRotation.Normal, PrintRotation.Right90, PrintRotation.Left90, PrintRotation.Rotate180
CoverOpen	false	—

- **Settings Related to Receipts**

Property	Setting Value/Default Value	Range of Settings
CapRec2Color	Refer to “Settings Affecting Changing of Print Colors”.	—
CapRecBarCode	true	—
CapRecBitmap	true	—
CapRecBold	true	—
CapRecCartridgeSensor	PrinterCartridgeSensors.None	—
CapRecColor	Refer to “Settings Affecting Changing of Print Colors”.	—
CapRecDhigh	true	—
CapRecDwide	true	—
CapRecDwideDhigh	true	—
CapRecEmptySensor	true	—
CapRecItalic	false	—
CapRecLeft90	true	—
CapRecMarkFeed	PrinterMarkFeeds.None	—
CapRecNearEndSensor	true	—
CapRecPageMode	true	—
CapRecPapercut	true	—
CapRecPresent	true	—
CapRecRight90	true	—
CapRecRotate180	true	—
CapRecStamp	false	—
CapRecUnderline	true	—
RecBarCodeRotationList	PrintRotation.Normal, PrintRotation.Right90, PrintRotation.Left90, PrintRotation.Rotate180	—
RecBitmapRotationList	PrintRotation.Normal, PrintRotation.Right90, PrintRotation.Left90, PrintRotation.Rotate180	—
RecCurrentCartridge	PrinterColors.Primary	—
RecCartridgeState	PrinterCartridgeStates.Unknown	—
RecEmpty	false	—
RecLetterQuality	false	true, false
RecLineChars	Refer to “Settings Affecting Changing of Paper Width”.	Refer to “Settings Affecting Changing of Paper Width”.
RecLineCharsList	Refer to “Settings Affecting Changing of Paper Width”.	—
RecLineHeight	24	The font height is adjusted to that of FontA or FontB specified in SlpLineChars.
RecLineSpacing	30	1 to 255
RecLinesToPaperCut	4 Changing RecLineSpacing configures the setting as follows. RecLinesToPaperCut = 109 ÷ RecLineSpacing (If the above calculation generates a remainder, perform the following calculation: RecLinesToPaperCut = RecLinesToPaperCut +1)	—
RecLineWidth	Refer to “Settings Affecting Changing of Paper Width”.	Refer to “Settings Affecting Changing of Paper Width”.
RecNearEnd	false	—
RecSidewaysMaxChars	Refer to “Settings Affecting Changing of Print Colors”.	—
RecSidewaysMaxLines	Refer to “Settings Affecting Changing of Paper Width”.	—

- **Settings Related to Slips**

Property	Setting Value/Default Value	Range of Settings
CapSlp2Color	false	—
CapSlpBarCode	false	—
CapSlpBitmap	true	—
CapSlpBold	"Endorse Multi Font" not checked: false "Endorse Multi Font" checked: true	—
CapSlpBothSidesPrint	true	—
CapSlpCartridgeSensor	PrinterCartridgeSensors.None	—
CapSlpColor	PrinterColors.Primary	PrinterColors.Primary
CapSlpDhigh	"Endorse Multi Font" not checked: false "Endorse Multi Font" checked: true	—
CapSlpDwide	"Endorse Multi Font" not checked: false "Endorse Multi Font" checked: true	—
CapSlpDwideDhigh	"Endorse Multi Font" not checked: false "Endorse Multi Font" checked: true	—
CapSlpEmptySensor	true	—
CapSlpItalic	false	—
CapSlpLeft90	false	—
CapSlpNearEndSensor	true	—
CapSlpPageMode	false	—
CapSlpPresent	true	—
CapSlpRight90	false	—
CapSlpRotate180	true	—
CapSlpUnderline	"Endorse Multi Font" not checked: false "Endorse Multi Font" checked: true	—
SlpBarCodeRotationList	“”	—
SlpBitmapRotationList	PrintRotation.Normal, PrintRotation.Rotate180	—
SlpCurrentCartridge	PrinterColors.Primary	—
SlpCartridgeState	PrinterCartridgeStates.Unknown	—
SlpEmpty	true	—
SlpLetterQuality	false	—
SlpLineChars	"Endorse Multi Font" not checked: 40 "Endorse Multi Font" checked: 25,33	1 to 40 Numbers described in SlpLineCharsList can be set. For any other value, if the set value is smaller than the maximum value supported by the printer, the value is set to the nearest value that is larger than the specified value in SlpLineCharsList properties.
SlpLineCharsList	"Endorse Multi Font" not checked: 40 "Endorse Multi Font" checked: 25,33	—
SlpLineHeight	"Endorse Multi Font" not checked: 7 "Endorse Multi Font" checked: 9	"Endorse Multi Font" not checked: Adjusted to 7. "Endorse Multi Font" checked: Adjusted to 9.
SlpLinesNearEndToEnd	0	—
SlpLineSpacing	"Endorse Multi Font" not checked: 10 "Endorse Multi Font" checked: 0 to 127	—
SlpLineWidth	"Endorse Multi Font" not checked: 240 "Endorse Multi Font" checked: 150	—
SlpMaxLines	0	—
SlpNearEnd	false	—
SlpPrintSide	PrintSide.Unknown	—
SlpSidewaysMaxChars	0	—
SlpSidewaysMaxLines	0	—

- **Device Specific Property Settings**

TM-H2000	DeviceDescription	"EPSON TM-H2000 Printer"	—
	DeviceName	"TM-H2000"	—

- **Settings Affecting Changing of Language**

Language	Property	Setting Value/Default Value	Range of Settings
ANK	CapCharacterSet	CharacterSetCapability.Unicode	—
	CharacterSet	997	One of the values in CharacterSetList.
	CharacterSetList	254, 255, 437, 850, 852, 858, 860, 863, 865, 866, 997, 998, 999, 1252	—

- **Settings Affecting Changing of Paper Width**

Paper Width	Property	Setting Value/Default Value	Range of Settings
58 mm	RecLineChars	35	1 to 46 Numbers described in RecLineCharsList can be set. For any other value, if the set value is smaller than the maximum value supported by the printer, the value is set to the nearest value that is larger than the specified value in RecLineCharsList properties.
	RecLineCharsList	35, 46	—
	RecLineWidth	420	—
	RecSidewaysMaxLines	The value resulting from the following calculation is set (after rounding it down to the nearest whole number). ((Value of RecLineWidth – 21 dots) ÷ (the largest value of RecLineSpacing and RecLineHeight)) +1.	—
80 mm	RecLineChars	48	1 to 64 Numbers described in RecLineCharsList can be set. For any other value, if the set value is smaller than the maximum value supported by the printer, the value is set to the nearest value that is larger than the specified value in RecLineCharsList properties.
	RecLineCharsList	48, 64	—
	RecLineWidth	576	—
	RecSidewaysMaxLines	The value resulting from the following calculation is set (after rounding it down to the nearest whole number). ((Value of RecLineWidth – 21 dots) ÷ (the largest value of RecLineSpacing and RecLineHeight)) +1.	—

- **Settings Affecting Changing of Print Colors**

Color	Property	Setting Value/Default Value	Range of Settings
One color	CapRec2Color	false	—
	CapRecColor	PrinterColors.Primary	—
	RecSidewaysMaxChars Note 1	123 (Font A), 164 (Font B)	—

Note 1: This is default value. This value is changed according to the RecLineChars property setting.

- **Settings Related to PageMode**

Station	Property	Setting Value/Default Value	Setting Value/Default Value
Receipt	PageModeArea	(Single color paper, width: 58.0mm) "420,1476" (Single color paper, width: 80.0mm) "576,1476"	—
	PageModeDescriptor	PageModeDescriptors.Barcode, PageModeDescriptors.BarcodeRotate, PageModeDescriptors.Bitmap, PageModeDescriptors.BitmapRotate	—
	PageModeHorizontalPosition	0	0 or more
	PageModePrintArea	"0,0,0,0"	"X, Y, Width, Height" (Single color paper, width: 58.0mm) X + Width <= 420 Y + Height <= 1476 (Single color paper, width: 80.0mm) X + Width <= 576 Y + Height <= 1476
	PageModePrintDirection	PageModePrintDirection.None	PageModePrintDirection.BottomToTop, PageModePrintDirection.LeftToRight, PageModePrintDirection.RightToLeft, PageModePrintDirection.TopToBottom
	PageModeVerticalPosition	0	0 or more

Appendix-E Escape Sequences

The following figure is about supported/unsupported Escape Sequences.

Escape Sequence	Range of Settings	
	Receipt	Slip
ESC|#P	0 to 100 (100) Note 1	—
ESC|#fP	0 to 100 (100) Note 1	—
ESC|#sP	—	—
ESC|sL	—	—
ESC|#B	1 to 20	—
ESC|tL	O	O
ESC|bL	O	O
ESC|#lF	0 to 9999 (1)	0 to 9999 (1)
ESC|#uF	0 to 9999 (1)	0 to 9999 (1)
ESC|#rF	—	0 to 255 (1)
ESC|#E	0 to 999 (1)	0 to 999 (1)
ESC|#fT	—	—
ESC|bC	O	"Endorse Multi Font" not checked: — "Endorse Multi Font" checked: O
ESC|#uC	0 to 2 (1)	"Endorse Multi Font" not checked: — "Endorse Multi Font" checked: 0 to 2 (1)
ESC|iC	—	—
ESC|#rC	Plain paper 1	1
ESC|rvC	O	—
ESC|#sC	—	—
ESC|1C	O	O
ESC|2C	O	"Endorse Multi Font" not checked: — "Endorse Multi Font" checked: O
ESC|3C	O	"Endorse Multi Font" not checked: — "Endorse Multi Font" checked: O
ESC|4C	O	"Endorse Multi Font" not checked: — "Endorse Multi Font" checked: O
ESC|#hC	1 to 8 (1)	"Endorse Multi Font" not checked: 1 "Endorse Multi Font" checked: 1 to 2 (1)
ESC|#vC	1 to 8 (1)	"Endorse Multi Font" not checked: 1 "Endorse Multi Font" checked: 1 to 2 (1)
ESC|tbC	—	—
ESC|tpC	—	—
ESC|cA	O	"Endorse Multi Font" not checked: — "Endorse Multi Font" checked: O
ESC|rA	O	"Endorse Multi Font" not checked: — "Endorse Multi Font" checked: O
ESC|lA	O	"Endorse Multi Font" not checked: — "Endorse Multi Font" checked: O
ESC|N	O	O
ESC|#R	1 to 999999999	—
ESC|#stC	0 to 1(1)	0 to 1(1)

The number in ( ) is the value when # is omitted.
O indicates the setting is possible.

Note 1: This Escape Sequence is not supported when 90-degree rotated print mode and Page mode.

Appendix-F DeviceStatistics

XML Definition Name	Description	Reset Permission	Update Permission
UnifiedPOSVersion	UPOS version	x	x
DeviceCategory	Device category	x	x
ManufactureName	Manufacturer name	x	x
ModelName	Device name	x	x
SerialNumber	Serial number	x	x
ManufactureDate	Manufacture date	x	x
MechanicalRevision	Device revision	x	x
FirmwareRevision	Firmware version	x	x
Interface	Interface	x	x
InstallationDate	Installation date	x	x
HoursPoweredCount	Operation time	O	x
CommunicationErrorCount	Communication error count	O	O
BarcodePrintedCount	Barcode print count	O	O
FormInsertionCount	Slip insertion count	O	O
HomeErrorCount	Mechanical error count	O	O
JournalCharacterPrintedCount	Journal character print count	x	x
JournalLinePrintedCount	Journal line print count	x	x
MaximumTempReachedCount	Head temperature error count	O	O
NVRAMWriteCount	NVRAM setting count	O	O
PaperCutCount	Paper cut count	O	x
FailedPaperCutCount	Paper cut failure count	O	O
PrinterFaultCount	Unrecoverable error count	O	O
PrintSideChangeCount	Slip side change count	O	O
FailedPrintSideChangeCount	Slip side change failure count	O	O
ReceiptCharacterPrintedCount	Receipt print character count	O	O
ReceiptLinePrintedCount	Receipt print line count	O	O
ReceiptLineFeedCount	Receipt line feed count	O	x
ReceiptCoverOpenCount	Receipt cover open count	O	O
SlipCharacterPrintedCount	Slip print character count	O	x
SlipLinePrintedCount	Slip print line count	O	O
SlipLineFeedCount	Slip line feed count	O	x
SlipCoverOpenCount	Slip cover open count	O	O
StampFiredCount	Stamp print count	x	x

O: Permitted
x: Not permitted