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EPSON OPOS ADK for .NET Manual

Application Development Guide

POSPrinter
(TM-U950)

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Notes

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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.

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- A "receipt", "journal", or "slip" indicates either a station or paper depending on the context.
- NVRAM indicates non-volatile random access memory.

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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   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.
- This device does not incorporate a power recovery function. When the power is turned on again, execute the **Release** method before executing the **Claim** method.

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	ServiceObject can determine and report two of the power states: OFF_OFFLINE (the device is off or offline) and ONLINE.
PowerReporting.Advanced	The value set when a parallel 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.Ascii	This value is set for devices with the ANK specification.
CharacterSetCapability.Kanji	This value is set for devices with specifications other than ANK.

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3.1.3 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
437	Code page 437. This value is set for devices with the ANK specification.
932	Code page 932. This value is set for devices with the JP specification.

After the **Claim** method is executed, the value may be changed depending on the actual language specification of the device.

3.1.4 CharacterSetList Property

Description

This property is initialized by the **Open** method according to the "Multi Byte Character Type" setting of SetupPOS utility.

However, after the **Claim** method is executed, the value may be changed depending on the actual language specification of the device.

3.1.5 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.

3.1.6 *Stn*LineChars Property
Description

Stn of the property name corresponds to **Jrn**, **Rec**, and **Slp**.

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.

3.1.7 *Stn*LineSpacing Property
Description

Stn of the property name corresponds to **Jrn**, **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.

3.1.8 *Stn*LetterQuality Property
Description

Stn of the property name corresponds to **Jrn**, **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
Journal・Receipt・Slip	Specifying/canceling of unidirectional printing.

3.1.9 SlpLinesNearEndToEnd Property
Description

This property is always set to 0.

3.1.10 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 Device Enabled 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 Device Enabled 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 Power Notify 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.

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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.

3.2.2 Release Method

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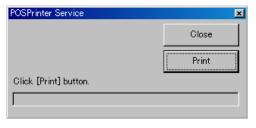
The connection is disconnected at the port where the device is connected.

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.

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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.

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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_BINARY_CONVERSION	Specifies the character string format specified in the parameter of the string type.
PTR_DI_GET_SUPPORT_FUNCTION	Returns the functions supported by the device currently connected.

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● **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, for instance, change the line feed amount or font size, since doing so will hinder the 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.

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● **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.

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

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- **PTR_DI_GET_SUPPORT_FUNCTION Command**

   Parameter

command	PTR_DI_GET_SUPPORT_FUNCTION
data	Not used
object	Not used

Description

Indicates the functions supported by the currently connected device with the logical OR of the function flag, and stores the returned value in the Data property of DirectIOData.

The value 0 is always stored in the Data property.

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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.

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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 **BeginInsertion** method checks whether there is a slip placed in the insertion opening of the slip station.

The slip station of devices supported by the ServiceObject cannot open the insertion opening for slips or enable paper insertion mode.

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 of "there is not a function" 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 or three points 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

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.

If PrinterStation.TwoReceiptJournal is specified for the *stations* parameter, the data of the *Data1* parameter is printed to the receipt station and the data of the *Data2* parameter is printed to the journal station.

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.Rotate180	**PrintTwoNormal**	Inverted print

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

3.2.23 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	75 dpi	72 dpi
Slip	75 dpi	72 dpi

3.2.24 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.

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Station	Landscape	Portrait
Receipt	75 dpi	72 dpi
Slip	75 dpi	72 dpi

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3.2.25 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 volatile memory. One image can be downloaded to the device.
The size upper 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.

Station	Number of Dots Wide	Number of Dots High	Total ((Number of Dots Wide ÷ 8) × (Number of Dots High ÷ 8))
Receipt	255 dots	255 dots	155
Slip	255 dots	255 dots	155

3.2.26 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

3.2.27 TransactionPrint Method
Description

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.

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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

- **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

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

(1) Microsoft POS for .NET 1.14.1 is supported.

A.2 EPSON OPOS ADK for .NET 1.12.24

(1) USB was added to the TM-U950 support interfaces.

A.3 EPSON OPOS ADK for .NET 1.11

(2) Microsoft POS for .NET 1.11 is supported.

(2) Changed Error codes for Hydra Devices.

(3) Changed initialization sequence.

A.4 EPSON OPOS ADK for .NET 1.9

(1) Microsoft POS for .NET 1.1 is supported.

A.5 EPSON OPOS ADK for .NET 1.8

POS Device driver complied with Microsoft POS for .NET 1.0 specification has been provided.
This version has been created based on EPSON OPOS ADK 2.40. The following shows the difference between this version and EPSON OPOS ADK2.40.

Differences from EPSON OPOS ADK2.40

(1) All ErrorCode resulting in an exception being thrown and ErrorCodeExtended have been revised.

(2) Commands that can be used with the **DirectIO** method were deleted or integrated. Therefore, some commands have been deleted or shifted to SetupPOS.

(3) The **DeviceEnabled** property state was deleted from the issue conditions of queued events. Therefore, an event may be reported even if the **DeviceEnabled** property is in the false state.

(4) The **SetBitmap** method dynamically saves an image to the most suitable location. The **DirectIOEvent** event notifies of the save location.

(5) The print character count, print line count, line feed amount, and barcode print count of rotated 90-degree print mode and transaction print mode are

reflected in the values that can be retrieved by the **RetrieveStatistics** method when printing is actually performed.

(6)　When the **Open** method is executed, a communication control class instance is generated. An exception is thrown if a communication control class instance is not generated when the **Open** method is executed.

(7)　If the slip is pulled out of the device, the device cancels the slip selection state and enters the receipt selection state.

(8)　If the **BeginInsertion** method and **EndInsertion** method of the printer are executed after the **BeginInsertion** method and **EndInsertion** method are executed by the MICR, insertion competes successfully. However, the slip paper is not fed to the top of form when the **EndInsertion** method is executed. The slip paper is fed to the top of form when printing is first started.

(9)　Code page 254 and code page 255 are supported.

(10)UPOS1.9 is supported.

Appendix-B   SetupPOS Settings

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

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B.2 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.3 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.4 Stamp Present Check Box

Description

Sets whether the device has a stamp function.

State	Meaning
Checkmark added	The device has a stamp function.
No checkmark added	The device has no stamp function.

- **When set to the device has a stamp function**
  The value of the **CapRecStamp** property becomes true.

Default: no checkmark added

B.5 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

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B.6 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.
Japanese	The device has a Japanese font.

● When set to the device has a Japanese font
  The **CharacterSet** property is set to 932.
  932 exists in the **CharacterSetList** property.
  Printing Japanese using the **PrintNormal** method and
  PrintImmediate method becomes possible if the **CharacterSet**
  property is 932.

Default: None (ANK)

B.7 Slip Clamp Time 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: 0 (ms)

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	Fixed to OFF Note 1
2	OFF	Note 1
3	OFF	Note 2
4	OFF	Note 2
5	OFF	Note 3
6	OFF	
7	OFF	Recommended
8	OFF	Recommended

DIP-SW 2

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

Note 1: Set the parity with 2 and 3 of DIP-SW1.

DIP Switch 1 Parity Settings

SW No.	Function	ON	OFF	Default
1-2	Parity check	Parity	No parity	OFF
1-3	Parity selection	Even parity	Odd parity	OFF

Note 2: Set the transmission speed with 4 and 5 of DIP-SW1.

DIP Switch 1 Transmission Speed Switching

SW1-4	SW1-5	Baud Rate (bps)
ON	ON	1200
OFF	ON	2400
ON	OFF	4800
OFF	OFF	9600

Note 3: Set the LineDisplay connection state with 6 of DIP-SW1.

Note 4: Set the reset signal with 7 and 8 of DIP-SW2.

2) Parallel connection

DIP-SW 1   DIP-SW 2

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

● **Memory Switch Settings**

This device has no memory switch.

3) USB connection

DIP-SW 1   DIP-SW 2

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

It is possible to change the settings of DIP-SW2-2 (Specification of the received
buffer capacity), but it is recommended to leave them OFF.
It is possible to change the settings of DIP-SW2-1 (Auto Line Feed) and
DIP-SW2-4(Carriage Moving Speed), but it is recommended to leave them OFF.
Make other settings in accordance with the settings described above.

● **Memory Switch Settings**

This device has no memory switch.

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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	"EPSON TM-U950 Printer"	—
DeviceName	"TM-U950"	—
State	ControlState.Idle	—
AsyncMode	false	true, false
CapCharacterSet	Refer to "Settings Affecting Changing of Language".	Refer to "Settings Affecting Changing of Language".
CapConcurrentJrnRec	true	—
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	""	—
PageModeDescriptor	PageModeDescriptors.None	—
PageModeHorizontalPosition	0	—
PageModePrintArea	""	—
PageModePrintDirection	PageModePrintDirection.None	—
PageModeStation	PrinterStation.None	—
PageModeVerticalPosition	0	—

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RotateSpecial	PrintRotation.Normal	—
CoverOpen	false	—

● **Settings Related to Journals**

Property	Setting Value/Default Value	Range of Settings
CapJrn2Color	false	—
CapJrnBold	true	—
CapJrnCartridgeSensor	PrinterCartridgeSensors.None	—
CapJrnColor	PrinterColors.Primary	—
CapJrnDhigh	true	—
CapJrnDwide	true	—
CapJrnDwideDhigh	true	—
CapJrnEmptySensor	true	—
CapJrnItalic	false	—
CapJrnNearEndSensor	true	—
CapJrnPresent	true	—
CapJrnUnderline	true	—
JrnCurrentCartridge	PrinterColors.Primary	—
JrnCartridgeState	PrinterCartridgeStates.Unknown	—
JrnEmpty	false	—
JrnLetterQuality	false	true, false
JrnLineChars	30	1 to 40 Numbers described in JrnLineCharsList 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 JrnLineCharsList properties.
JrnLineCharsList	30, 40	—
JrnLineHeight	9	The font height is adjusted to that of FontA or FontB specified in JrnLineChars.
JrnLineSpacing	12	0 to 255
JrnLineWidth	180	—
JrnNearEnd	false	—

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● **Settings Related to Receipts**

Property	Setting Value/Default Value	Range of Settings
CapRec2Color	false	—
CapRecBarCode	false	—
CapRecBitmap	true	—
CapRecBold	true	—
CapRecCartridgeSensor	PrinterCartridgeSensors.None	—
CapRecColor	PrinterColors.Primary	—
CapRecDhigh	true	—
CapRecDwide	true	—
CapRecDwideDhigh	true	—
CapRecEmptySensor	true	—
CapRecItalic	false	—
CapRecLeft90	false	—
CapRecMarkFeed	PrinterMarkFeeds.None	—
CapRecNearEndSensor	true	—
CapRecPageMode	false	—
CapRecPapercut	true	—
CapRecPresent	true	—
CapRecRight90	false	—
CapRecRotate180	true	—
CapRecStamp	false	True is set when the use of Stamp is set with the utility.
CapRecUnderline	true	—
RecBarCodeRotationList	""	—
RecBitmapRotationList	PrintRotation.Normal, PrintRotation.Rotate180	—
RecCurrentCartridge	PrinterColors.Primary	—
RecCartridgeState	PrinterCartridgeStates.Unknown	—
RecEmpty	false	—
RecLetterQuality	false	true, false
RecLineChars	30	1 to 40 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	30, 40	—
RecLineHeight	9	The font height is adjusted to that of FontA or FontB specified in RecLineChars.
RecLineSpacing	12	0 to 255
RecLinesToPaperCut	10 Changing RecLineSpacing configures the setting as follows. RecLinesToPaperCut = 123 ÷ RecLineSpacing (If the above calculation generates a remainder, perform the following calculation: RecLinesToPaperCut = RecLinesToPaperCut +1)	—
RecLineWidth	180	—
RecNearEnd	false	—
RecSidewaysMaxChars	0	—
RecSidewaysMaxLines	0	—

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● **Settings Related to Slips (Front Side)**

Property	Setting Value/Default Value	Range of Settings
CapSlp2Color	false	—
CapSlpBarCode	false	—
CapSlpBitmap	true	—
CapSlpBold	true	—
CapSlpBothSidesPrint	false	—
CapSlpCartridgeSensor	PrinterCartridgeSensors.None	—
CapSlpColor	PrinterColors.Primary	—
CapSlpDhigh	true	—
CapSlpDwide	true	—
CapSlpDwideDhigh	true	—
CapSlpEmptySensor	true	—
CapSlpFullslip	true	—
CapSlpItalic	false	—
CapSlpLeft90	false	—
CapSlpNearEndSensor	true	—
CapSlpPageMode	false	—
CapSlpPresent	true	—
CapSlpRight90	false	—
CapSlpRotate180	true	—
CapSlpUnderline	true	—
SlpBarCodeRotationList	""	—
SlpBitmapRotationList	PrintRotation.Normal, PrintRotation.Rotate180	—
SlpCurrentCartridge	PrinterColors.Primary	—
SlpCartridgeState	PrinterCartridgeStates.Unknown	—
SlpEmpty	true	—
SlpLetterQuality	false	true, false
SlpLineChars	66	1 to 88 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	66, 88	—
SlpLineHeight	9	The font height is adjusted to that of FontA or FontB specified in SlpLineChars.
SlpLinesNearEndToEnd	0	—
SlpLineSpacing	12	0 to 255
SlpLineWidth	400	—
SlpMaxLines	0	—
SlpNearEnd	false	—
SlpPrintSide	PrintSide.Unknown	—
SlpSidewaysMaxChars	0	—
SlpSidewaysMaxLines	0	—

● **Settings Affecting Changing of Language**

Language	Property	Setting Value/Default Value	Range of Settings
ANK	CapCharacterSet	CharacterSetCapability.Ascii	—
	CharacterSet	437	One of the values in CharacterSetList
	CharacterSetList	254, 255, 437, 850, 858, 860, 863, 865	—
Japanese	CapCharacterSet	CharacterSetCapability.Kanji	—
	CharacterSet	932	One of the values in CharacterSetList
	CharacterSetList	254, 255, 437, 850, 858, 860, 863, 865, 932	—

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Appendix-E   Escape Sequences

The following figure is about supported/unsupported Escape Sequences.

Device	Escape Sequence	Range of Settings		
		Journal	Receipt	Slip
TM-U950	ESC|#P	—	0 to 100 (100)	—
	ESC|#fP	—	0 to 100 (100)	—
	ESC|#sP	—	0 to 100 (100)	—
	ESC|sL	—	O	—
	ESC|#B	—	1 to 20	1 to 20
	ESC|tL	O	O	O
	ESC|bL	O	O	O
	ESC|#lF	0 to 9999 (1)	0 to 9999 (1)	0 to 9999 (1)
	ESC|#uF	0 to 9999 (1)	0 to 9999 (1)	0 to 9999 (1)
	ESC|#rF	0 to 255 (1)	0 to 255 (1)	0 to 255 (1)
	ESC|#E	0 to 999 (1)	0 to 999 (1)	0 to 999 (1)
	ESC|#fT	—	—	—
	ESC|bC	O	O	O
	ESC|#uC	0 to 1 (1)	0 to 1 (1)	0 to 1 (1)
	ESC|iC	—	—	—
	ESC|#rC	1 (1)	1 (1)	1 (1)
	ESC|rvC	—	—	—
	ESC|#sC	—	—	—
	ESC|1C	O	O	O
	ESC|2C	O	O	O
	ESC|3C	O	O	O
	ESC|4C	O	O	O
	ESC|#hC	1 to 2 (1)	1 to 2 (1)	1 to 2 (1)
	ESC|#vC	1 to 2 (1)	1 to 2 (1)	1 to 2 (1)
	ESC|tbC	—	—	—
	ESC|tpC	—	—	—
	ESC|cA	O	O	O
	ESC|rA	O	O	O
	ESC|lA	O	O	O
	ESC|N	O	O	O
	ESC|#R	—	—	—

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

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Appendix-F   DeviceStatistics

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

O: Permitted
×: Not permitted

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