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EPSON OPOS ADK for .NET Manual

Application Development Guide

POSPrinter

(TM-L90)

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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 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.
- Not all Unicode characters can be printed even if PosCommon.CharacterSetUnicode is specified in the **CharacterSet** property. The assignment of Unicode characters to printable characters is limited to the characters installed on the device. The characters installed on a device vary depending on the device specification. Please refer to the product specification for your particular device.
- 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.
- 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.
- A partial cut leaving one point uncut or full cut is performed with the **CutPaper** method. However, this switch does not take place at the ServiceObject. Shifting the cutter position of device facilitates the switch.

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	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	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 CapRecMarkFeed Property

Description

This property is initialized by the **Open** method in accordance with the settings of the Peeler Present and Enable Peeler check boxes of SetupPOS Settings. However, after the **Claim** method is executed, the value may be changed depending on the actual paper settings and incorporated functions of the device.

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.

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 RecLineChars Property

Description

After the **Claim** method is executed, the value may be changed according to the specification of the device.
Only a value in the **RecLineCharsList** property can be set.

3.1.8 RecLineCharsList Property

Description

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

3.1.9 RecLineSpacing Property

Description

A value smaller than the **RecLineHeight** property can also be set for this property.

If a value smaller than the **RecLineHeight** property is set, it is changed to the value of the **RecLineHeight** property for operation. Character strings in the first and second lines do not overlap when printed.

3.1.10 RecLineWidth Property

Description

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

3.1.11 RecLetterQuality Property

Description

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 **RecLineWidth** and **RecLineSpacing**.

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

3.1.12 RecSidewaysMaxLines Property

Description

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

3.1.13 DeviceEnabled property

Description

When the **DeviceEnabled** 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

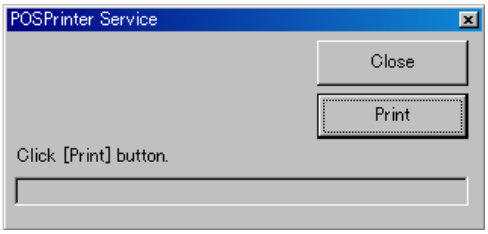
Description

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_LABEL_SET_PRINT_MODE	Sets counter print mode.
PTR_DI_LABEL_SET_COUNT_MODE	Sets count mode of the counter.
PTR_DI_LABEL_PRINT_COUNT	Prints the counter.
PTR_DI_LABEL_SET_COUNT_VALUE	Sets the counter value.
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_GET_SUPPORT_FUNCTION	Returns the functions supported by the device currently connected.
PTR_DI_CUT_AND_FEED_TOF	Cuts the paper and then feeds the paper to the top of form.
PTR_DI_RING_BUZZER_WITH_TIME	Executes buzzer control.

- **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_LABEL_SET_PRINT_MODE Command**

Parameter

command	PTR_DI_LABEL_SET_PRINT_MODE
data	Specify one of the following. • PTR_DI_LABEL_RIGHT_SPACE • PTR_DI_LABEL_RIGHT_ZERO • PTR_DI_LABEL_LEFT_SPACE
object(String type)	Specify a number from 0 to 5.

Description

Specifies the counter printing format.
Use the *object* parameter to specify the counter printing digit number. When 0, the counter printing digit number becomes the counter digit number.
When the printing digit number is 0 or 1, neither left justification nor right justification takes place.
When the counter value is larger than the specified digit number, the specified digit number is used for printing.

Specify the format in accordance with the number of the *object* parameter as shown below.

object	**Outline of Process**
PTR_DI_LABEL_RIGHT_SPACE	Right justify and space fill are specified.
PTR_DI_LABEL_RIGHT_ZERO	Right justify and zero fill are specified.
PTR_DI_LABEL_LEFT_SPACE	Left justify and space fill are specified.

- **PTR_DI_LABEL_SET_COUNT_MODE Command**

Parameter

command	PTR_DI_LABEL_SET_COUNT_MODE
data	Not used
object(String type)	Specify the character strings showing the range, value, count-up value, and number of repeats of the counter .

Description

Specifies the range, value, count-up value, and number of repeats of the counter.
In *object*, use the “sa ;sb ;sn ;sr ;sc” format to specify the range, value, and so on of the counter.
When the range of the counter is exceeded, the value returns to the smallest value or largest value of the range.
If the sc value is outside the range, the smallest value or largest value of the range is specified.
The internal counter for showing the number of times printing repeats is cleared.

The meaning and specified range of each value are shown below.

object	**Outline of Process**
“0” <= sa <= “65535”	Range of the counter
“0” <= sb <= “65535”	Range of the counter
“0” <= sn <= “255”	Number of count up/down steps of the counter
“0” <= sr <= “255”	Number of times repeated while the counter value is fixed
“0” <= sc <= “65535”	Value of the counter
sa < sb, sa != 0, and sb != 0	Count-up mode
sa > sb, sa != 0, and sb != 0	Count-down mode
sa = sb, sa = 0, or sb = 0	Count stops

- **PTR_DI_LABEL_PRINT_COUNT Command**

Parameter

command	PTR_DI_LABEL_PRINT_COUNT
data	Not used
object	Not used

Description

Prints the counter.
As no line feed is added, the counter is actually printed if the **PrintNormal** method and **PrintImmediate** method are used to output a line feed.
An illegal operation may occur if the **PrintBitmap** method and **PrintBarCode** method are executed immediately after this command. Therefore, before executing these commands, use the **PrintNormal** method to output a line feed.

- **PTR_DI_LABEL_SET_COUNT_VALUE Command**

Parameter

command	PTR_DI_LABEL_SET_COUNT_VALUE
data	Specify the counter value (0 to 65535)
object	Not used

Description

Updates the counter value.
Specify the value to update for *data*.
If a value specified using PTR_DI_LABEL_SET_COUNT_MODE is outside the range, the smallest value or largest value of the range is specified.

- **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_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 defined function flags are as follows.

Function Flag	Meaning
PTR_DI_LABEL	Label paper is loaded in the printer.
PTR_DI_BLACKMARK	Black mark paper is loaded in the printer.
PTR_DI_PEELER	The printer is operating in peeler mode.

- **PTR_DI_CUT_AND_FEED_TOF Command**

Parameter

command	PTR_DI_CUT_AND_FEED_TOF
data	Cut rate
object	Not used

Description

Cuts the paper and then feeds the paper to the top of form.
When this command is executed, the printer first feeds the paper to the cut position. The paper is then cut using the specified cut rate and fed to the top of form.
Feeding the paper to the top of form after cutting allows for a reduction in blank space at the top of the paper, thus enabling efficient use of the paper. Furthermore, use of this command is possible irrespective of paper type because it can also be used with the receipt paper setting.

Though the cutting rate can be specified using the *data* parameter of **DirectIO**, for this device, the cutting rate does not change according to the value of *data* parameter, because the cutting rate depends on the installed position of the auto cutter unit. However, when values other than 0 to 100 are specified with the *data* parameter, an exception is thrown.

- **PTR_DI_RING_BUZZER_WITH_TIME Command**

Parameter

command	PTR_DI_RING_BUZZER_WITH_TIME
data	Specifies the buzzer operating time (milliseconds).
object	Not used

Description

Sounds the buzzer for the time specified with the *data* parameter.
The settable buzzer operating time is 0 to 510 milliseconds. This command can only be executed when the device is used with a network connection. If other connections are used, an exception is thrown.

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

This device the exception is thrown because there is not a slip station.

3.2.13 BeginRemoval Method

Description

This device the exception is thrown because there is not a slip station.

3.2.14 ChangePrintSide Method

Description

This device the exception is thrown because there is not a slip station.

3.2.15 MarkFeed Method

Description

If the *type* parameter is PrinterMarkFeeds.CurrentTopOfForm or PrinterMarkFeeds.NextTopOfForm, the device checks to see whether the label paper is positioned so that it can be fed to the top of form.
If its position is such that it cannot be fed to the top of form, it cannot be moved to the correct position.
When the **MarkFeed** method is executed in synchronous mode, the position of the label paper is checked and an exception is thrown if the position is such that the label paper cannot be fed to the top of form.
When the **MarkFeed** method is executed in asynchronous mode or transaction mode, the label paper may not be able to be moved to the correct position because the position of the label paper is not checked.
Furthermore, when there is a peeler function and this method is executed in peeler mode, the label paper is fed to the peel-off position and the device enters label paper removal standby if PrinterMarkFeeds.Takeup is specified for the *type* parameter.
A method involving both printing and paper feeding cannot be executed while the device is in label paper removal standby.
After the label paper is removed, even specifying PrinterMarkFeeds.Takeup for the parameter and executing the method generates an error if the label is in a state of not having been fed to the top of form.

3.2.16 EndInsertion Method

Description

This device the exception is thrown because there is not a slip station.

3.2.17 EndRemoval Method

Description

This device the exception is thrown because there is not a 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 or full cut.

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

This device has only one station, 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** **MarkFeed (PrinterMarkFeeds.Takeup)** (when there is a peeler function and in peeler mode)	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
- MAXICODE
- QRCODE
- OTHER
- OTHER + 1
- OTHER + 2
- OTHER + 3
- OTHER + 4
- GS1-DataBar
- GS1-DataBar 128
- GS1-DataBar Expanded
- GS1-DataBar Stacked Omnidirectional
- GS1-DataBar Expanded Stacked
- 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)
- MicroQR
- DataMatrix

However, if the following, PDF417 cannot be printed.

- Continuous Form Paper
  (width) 38 mm or less
- Label Paper
  (width) 38 to 42 mm
- The layout setting is set and the **RecLineWidth** property is less than 258 dots.

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

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

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.

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	368 dots	1536 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)

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.
When there is a peeler function and the device is in peeler mode, the **MarkFeed** method is buffered to the ServiceObject if PrinterMarkFeeds.Takeup is specified for the **MarkFeed** method *type* parameter and the method is executed while buffering to the ServiceObject in transaction mode. However, buffering to the ServiceObject is controlled from then on (an error is generated if the **PrintNormal** method or another method is executed).

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**	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 (L
- GS 8 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.

- **PTR_DIE_BUTTON_OPERATION Event Number**

Property	
EventNumber	PTR_DIE_BUTTON_OPERATION
Data	0 (not used)
Object	0 (not used)

Description

Notifies that the device is waiting for the feed button to be pressed. This event is reported at the model incorporating a peeler when the peeler mode is used.

- **PTR_DIE_LABEL_REMOVAL Event Number**

Property

EventNumber	PTR_DIE_LABEL_REMOVAL
Data	0 (not used)
Object	0 (not used)

Description

Notifies that the device is waiting for removal of the peeled off label.
If the label is removed, DirectIOEvent of the PTR_DIE_LABEL_REMOVE_OK event number is reported.
This event is reported at the model incorporating a peeler when the peeler mode is used.

- **PTR_DIE_LABEL_REMOVE_OK Event Number**

Property

EventNumber	PTR_DIE_LABEL_REMOVE_OK
Data	0 (not used)
Object	0 (not used)

Description

Notifies that the peeled off label has been removed.
This event is reported at the model incorporating a peeler when the peeler mode is used.

- **PTR_DIE_LABEL_JAM Event Number**

Property

EventNumber	PTR_DIE_LABEL_JAM
Data	0 (not used)
Object	0 (not used)

Description

Notifies that there is a label paper jam.
This event is reported at the model incorporating a peeler.

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 1.12.11

(2) Added support for MicroQR Barcode.

(3) Added support for Datamatrix Barcode.

(4) Added support for GS1 Barcode.

A.3 EPSON OPOS ADK for .NET 1.12

(1) Microsoft POS for .NET 1.12 is supported.

(2) Added response type issued by DirectIOEvnet.

(3) Code page 997 is supported.

A.4 EPSON OPOS ADK for .NET 1.11

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

(2) Changed Error codes for Hydra Devices.

(3) Changed initialization sequence.

A.5 EPSON OPOS ADK for .NET 1.9

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

A.6 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 ADK 2.40

(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. The **DirectIOEvent** event notifies of the save location even if the device is set not to use NVRAM.

(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) When using the **PrintBitmap** method to print an image onto label paper, the label height and print height are compared to check whether printing is possible. If the image print height exceeds the label height, an exception is thrown.

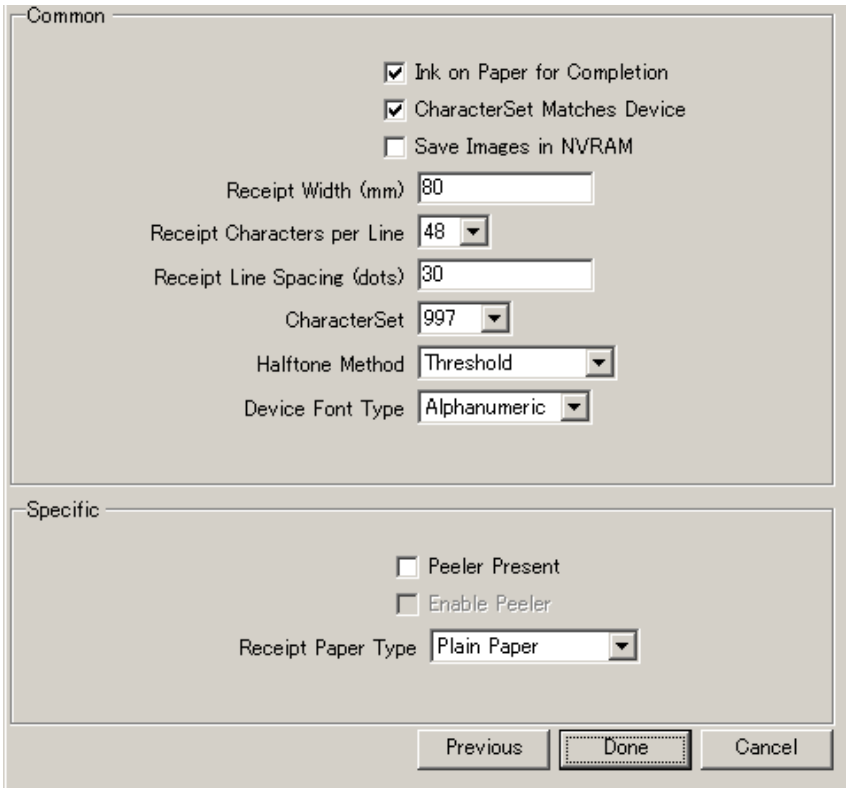
(8) If print data including a CR (carriage return) is specified for **ValidateData** method, an exception is thrown when the method is executed even if there is only a CR at the beginning of a line.

(9) If the ***Stn*LetterQuality** property is set to false, the image is sent with lower resolution. Therefore, if the **PrintBitmap** method and **SetBitmap** method are executed with this setting, the performance of the methods improves, but the image printing quality may fall.

(10) Code page 255 is supported.

(11) 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

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

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 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 Peeler Present Check Box

Description

Sets whether the device has a label peeler function.

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

- **When set to device has a label peeler function**
  Allows the setting of whether to enable the peeler function in the SetupPOS settings. The paper cut position differs if the device has a label peeler function. Therefore, the value of the **RecLinesToPaperCut** property increases.

Default: no checkmark added

B.6 Enable Peeler Check Box

Description

Sets whether to enable the label peeler function for the device.

State	Meaning
Checkmark added	Enables the label peeler function.
No checkmark added	Disables the label peeler function.

- **When set to enable the label peeler function**
  The value of the **CapRecMarkFeed** property becomes PrinterMarkFeeds.CurrentTopOfForm | PrinterMarkFeeds.Takeup.

Default: no checkmark added

B.7 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	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.8 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 exist 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.9 Receipt Paper Type Combo Box

Description

Sets the type of paper loaded in the device.

Item	Meaning
Plain Paper	Plain paper is set in the device.
Label Roll	Label paper is set in the device.
Black mark paper	Receipt paper with black marks is set in the device.

- **When “Plain Paper” is selected**
  The **MarkFeed** method cannot be executed.
- **When “Label Roll” is selected**
  The **MarkFeed** method can be executed.
- **When “Black mark paper” is selected**
  The **MarkFeed** method can be executed.

Default: Plain Paper

B.10 Receipt Width Text Box

Description

Sets the receipt paper width.

Item	Meaning
38 mm to 80 mm	Sets the paper width from 38 mm to 80 mm.

Default: 80 mm

B.11 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.
437, 720, 737, 775, 850, 851, 852, 853, 855, 857, 858, 860, 861, 862, 863, 864, 865, 866, 869, 998, 999, 1098, 1125, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258	Printed with the standard code page.
932	Only when DeviceFontType is set to "Japanese"
120, 121, 126, 130, 131, 150, 151, 152, 153, 154, 155, 255	Printed with the Device-specific Character CodePage.

Default: 997

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

Note 1: Set whether to use the memory switches or DIP switches to set the transmission speed with 2 of DIP-SW1.

Note 2: 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 3: 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	2400
OFF	ON	4800
ON	OFF	9600
OFF	OFF	19200

2) Parallel connection

DIP-SW 1

No.	Setting	
1	OFF	Settable
2	ON	Fixed to ON
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

3) USB connection and Network connection

DIP-SW 1

No.	Setting	
1	OFF	Settable
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

- **Memory Switch Settings**

  Set the memory switches of this device as shown below.

- **TM-L90**

Mem-SW 1

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

Mem-SW 2

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

Mem-SW 8

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

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

Note 2: The setting is fixed by the ServiceObject.

Note 3: Set ON when using a parallel connection and set OFF when using a connection other than Parallel connection.

Note 4: Set the reset signal selection with 7 and 8 of Mem-SW1.

Note 5: Set 8 of Mem-SW1 to ON for a network connection and to OFF for a connection other than network.

● **TM-L90 Peeler**

Mem-SW 1

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

Mem-SW 7

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

Mem-SW 8

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

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

Note 2: The setting is fixed by the ServiceObject.

Note 3: Set ON when using a parallel connection and set OFF when using a connection other than Parallel connection.

Note 4: Set the reset signal selection with 7 and 8 of Mem-SW1.

Note 5: Set 8 of Mem-SW1 to ON for a network connection and to OFF for a connection other than network.

Note 6: Set the operation performed upon pressing the feed switch with 8 of Mem-SW7.

Appendix-D Default Values of Properties

- **Common Settings**

Property	Setting Value/Default Value	Range of Settings
CapCompareFirmwareVersion	false	—
CapPowerReporting	(Serial connection) PowerReporting.Standard (Other connection) 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-L90 Printer”	—
DeviceName	“TM-L90”	—
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	true	—
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
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	false	—
CapRecBarCode	true	—
CapRecBitmap	true	—
CapRecBold	true	—
CapRecCartridgeSensor	PrinterCartridgeSensors.Unknown	—
CapRecColor	PrinterColors.Primary	—
CapRecDhigh	true	—
CapRecDwide	true	—
CapRecDwideDhigh	true	—
CapRecEmptySensor	true	—
CapRecItalic	false	—
CapRecLeft90	true	—
CapRecMarkFeed	Refer to “Device Specific Property Settings”.	—
CapRecNearEndSensor	true	—
CapRecPageMode	true	—
CapRecPapercut	Refer to “Device Specific Property Settings”.	—
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 RecLineChars.
RecLineSpacing	30	1 to 255
RecLinesToPaperCut	Refer to “Device Specific Property Settings”.	—
RecLineWidth	Refer to “Settings Affecting Changing of Paper Width”.	Refer to “Settings Affecting Changing of Paper Width”.
RecNearEnd	false	—
RecSidewaysMaxChars	(ANK) (Font A) 1 to 123 (Font B) 1 to 164 (JP) (Font A) 1 to 123 (Font B) 1 to 147 (Font C) 1 to 184	—
RecSidewaysMaxLines	Refer to “Settings Affecting Changing of Paper Width”.	—

- **Device Specific Property Settings**

Device	Paper Type	Property	Setting Value/Default Value	Range of Settings
Without Peeler Function	Receipt without Black Mark	CapRecMarkFeed	PrinterMarkFeeds.None	—
		CapRecPaperCut	true	—
		RecLinesToPaperCut	5 Changing RecLineSpacing configures the setting as follows. RecLinesToPaperCut = 153 ÷ RecLineSpacing (If the above calculation generates a remainder, perform the following calculation: RecLinesToPaperCut = RecLinesToPaperCut +1)	—
	Receipt with Black Mark	CapRecMarkFeed	PrinterMarkFeeds.Takeup, PrinterMarkFeeds.Cutter, PrinterMarkFeeds.CurrentTopOfForm, PrinterMarkFeeds.NextTopOfForm	—
		CapRecPaperCut	true	—
		RecLinesToPaperCut	5 Changing RecLineSpacing configures the setting as follows. RecLinesToPaperCut = 153 ÷ RecLineSpacing (If the above calculation generates a remainder, perform the following calculation: RecLinesToPaperCut = RecLinesToPaperCut +1)	—
	Label	CapRecMarkFeed	PrinterMarkFeeds.Takeup, PrinterMarkFeeds.Cutter, PrinterMarkFeeds.CurrentTopOfForm, PrinterMarkFeeds.NextTopOfForm	—
		CapRecPaperCut	true	—
		RecLinesToPaperCut	5 Changing RecLineSpacing configures the setting as follows. RecLinesToPaperCut = 153 ÷ RecLineSpacing (If the above calculation generates a remainder, perform the following calculation: RecLinesToPaperCut = RecLinesToPaperCut +1)	—
With Peeler Function	Receipt without Black Mark	CapRecMarkFeed	PrinterMarkFeeds.None	—
		CapRecPaperCut	false	—
		RecLinesToPaperCut	7 Changing RecLineSpacing configures the setting as follows. RecLinesToPaperCut = 200 ÷ RecLineSpacing (If the above calculation generates a remainder, perform the following calculation: RecLinesToPaperCut = RecLinesToPaperCut +1)	—
	Receipt with Black Mark	CapRecMarkFeed	PrinterMarkFeeds.Takeup, PrinterMarkFeeds.CurrentTopOfForm, PrinterMarkFeeds.NextTopOfForm When in peeler mode: (No setting)	—
		CapRecPaperCut	false	—
		RecLinesToPaperCut	7 Changing RecLineSpacing configures the setting as follows. RecLinesToPaperCut = 200 ÷ RecLineSpacing (If the above calculation generates a remainder, perform the following calculation: RecLinesToPaperCut = RecLinesToPaperCut +1)	—
	Label	CapRecMarkFeed	PrinterMarkFeeds.Takeup, PrinterMarkFeeds.CurrentTopOfForm, PrinterMarkFeeds.NextTopOfForm When in peeler mode: PrinterMarkFeeds.Takeup, PrinterMarkFeeds.CurrentTopOfForm	—
		CapRecPaperCut	false	—
		RecLinesToPaperCut	7 Changing RecLineSpacing configures the setting as follows. RecLinesToPaperCut = 200 ÷ RecLineSpacing (If the above calculation generates a remainder, perform the following calculation: RecLinesToPaperCut = RecLinesToPaperCut +1)	—

- **Settings Affecting Changing of Language**

Language	Property	Setting Value/Default Value	Range of Settings
ANK	CapCharacterSet	CharacterSetCapability.Unicode	—
	CharacterSet	CharacterSetUnicode	One of the values in CharacterSetList
	CharacterSetList	120,121,126,130,131,150,151,152,153,154,255,437,720,737,775,850,851,852,853,855,857,858,860,861,862,863,864,865,866,869,997,998,999,1048,1098,1125,1250,1251,1252,1253,1254,1255,1256,1257,1258	—
Japanese	CapCharacterSet	CharacterSetCapability.Unicode	—
	CharacterSet	CharacterSetUnicode	One of the values in CharacterSetList
	CharacterSetList	120,121,126,130,131,150,151,152,153,154,255,437,720,737,775,850,851,852,853,855,857,858,860,861,862,863,864,865,866,869,932,997,998,999,1048,1098,1125,1250,1251,1252,1253,1254,1255,1256,1257,1258	—

- **Settings Affecting Changing of Paper Width**

Paper Width	Property	Setting Value/Default Value	Range of Settings
78 mm to 80 mm	RecLineChars	48	In accordance with the XML setting 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	(ANK) “48,64” (JP) “48,57,72”	—
	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.	—
38 mm to 77.9 mm	RecLineChars	Value of RecLineWidth/12	In accordance with the XML setting 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	(ANK) “FontA, FontB” FontA = value of RecLineWidth/12 FontB = value of RecLineWidth/9 (JP) “FontA, FontB, FontC” FontA = value of RecLineWidth/12 FontB = value of RecLineWidth/10 FontC = value of RecLineWidth/8	—
	RecLineWidth	256 + (paper width – 38) × 8	—
	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 Related to PageMode**

Property	Setting Value/Default Value	Range of Settings
PageModeArea	(Single color roll paper) "256 to 576, 1476" (Single color label paper) "224 to 560, 1476"	—
PageModeDescriptor	PageModeDescriptors.Barcode, PageModeDescriptors.Bitmap, PageModeDescriptors.BitmapRotate, PageModeDescriptors.BarcodeRotate	—
PageModeHorizontalPosition	0	0 or more
PageModePrintArea	"0,0,0,0"	"X, Y, Width, Height" X + Width <= PageModeArea width Y + Height <= PageModeArea Height
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.

Device	Escape Sequence	Range of Settings
TM-L90	ESC|#P	0 to 100 (100)
	ESC|#fP	0 to 100 (100)
	ESC|#sP	—
	ESC|sL	—
	ESC|#B	1 to 20
	ESC|tL	O
	ESC|bL	O
	ESC|#lF	0 to 9999 (1)
	ESC|#uF	0 to 9999 (1)
	ESC|#rF	—
	ESC|#E	0 to 999 (1)
	ESC|#fT	—
	ESC|bC	O
	ESC|#uC	0 to 2 (1)
	ESC|iC	—
	ESC|#rC	Plain paper 1
	ESC|rvC	O
	ESC|#sC	—
	ESC|1C	O
	ESC|2C	O
	ESC|3C	O
	ESC|4C	O
	ESC|#hC	1 to 8 (1)
	ESC|#vC	1 to 8 (1)
	ESC|tbC	—
	ESC|tpC	—
	ESC|cA	O
	ESC|rA	O
	ESC|lA	O
	ESC|N	O
	ESC|#R	1 to 999999999
	ESC|#stC	0 to 1(1)

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

Appendix-F DeviceStatistics

TM-L90

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	x	x
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	x	x
FailedPrintSideChangeCount	Slip side change failure count	x	x
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	x	x
SlipLinePrintedCount	Slip print line count	x	x
SlipLineFeedCount	Slip line feed count	x	x
SlipCoverOpenCount	Slip cover open count	x	x
StampFiredCount	Stamp print count	x	x

O: Permitted
x: Not permitted