

EPSON OPOS ADK for .NET Manual

Application Development Guide

**POSPrinter
(TM-T88V)**

Version 1.14.6 Dec. 2017

Notes

- (1) Reproduction of any part of this documentation by any means is prohibited.
- (2) The contents of this documentation are subject to change without notice.
- (3) Comments and notification of any mistakes in this documentation are gratefully accepted.
- (4) This software cannot be used with other equipment than the specified.
- (5) EPSON will not be responsible for any consequences resulting from the use of any information in this documentation.

Trademarks

Microsoft®, Windows®, Windows Server® and Windows Vista® are trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries. IBM® and PC/AT® are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both.

QR Code is a registered trademark of Denso Wave Incorporated.

Epson® and ESC/POS® are registered trademarks of Seiko Epson Corporation. Other product and company names used herein are for identification purposes only and may be trademarks or registered trademarks of their respective companies. Epson disclaims any and all rights in those marks.

The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by Seiko Epson is under license. Other trademarks and trade names are those of their respective owners.

Contents

Chapter 1 Introduction	1
1.1 Terminology	1
Chapter 2 Before Using POSPrinter	3
2.1 Device Setup	3
2.2 Precautions and Restrictions	3
Chapter 3 Properties, Methods, and Events	5
3.1 Properties	5
3.2 Methods	10
3.3 Events	34
Appendix-A Revision history	36
A.1 EPSON OPOS ADK for .NET 1.14.6	36
A.2 EPSON OPOS ADK for .NET 1.12.17	36
A.3 EPSON OPOS ADK for .NET 1.12	36
A.4 Differences from the TM-T88IV	36
Appendix-B SetupPOS Settings	37
B.1 Verbose Error Codes Check Box	37
B.2 CharSet Matches Device Check Box	38
B.3 Save Images in NVRAM Check Box	38
B.4 Receipt Characters per Line Combo Box	39
B.5 Receipt Line Spacing (dots) Text Box	39
B.6 Ink on Paper for Completion Check Box	40
B.7 CharSet Combo Box	41
B.8 Halftone Method Combo Box	42
B.9 Device Font Type Combo Box	43
B.10 Gradation Combo Box	43
Appendix-C Hardware Settings	44
Appendix-D Default Values of Properties	47
Appendix-E Escape Sequences	52
Appendix-F DeviceStatistics	53

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": Refer to the release notes for information on where to find the latest information.

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, "**StnLineChars**" 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

- When using a 90 degree rotation and printing with a layout that prints to the edge of the paper, sometimes the bottom portion of print area will not be printed. Reducing the value of the **RecLineSpacing** property can correct this issue.
When Font B is used, the number of lines that can be printed by the TM-T88V is sometimes less than what can be printed by the TM-T88IV. Please also modify the value of the **RecLineSpacing** property in this case.
- 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 varies depending on the device specification. Please refer to the product specification for your particular device.
- 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.
- 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.
- 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. The switch is accomplished by shifting the cutter position of the device.

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 or bluetooth 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 utility. 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 CharacterSet Property

Description

Only a value in the **CharacterSetList** property can be set.

If the value of the property is set to 932, the print character for the ASCII code 0x5C is changed to the yen mark (¥).

The property is initialized to one of the following values.

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

This property is initialized by the **Open** method according to the SetupPOS setting "CharacterSet".

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

The same Unicode code point is assigned to some characters which are defined in both the device Kanji and non-Kanji character tables.

e.g.:

U+0391(Greek Capital Letter Alpha)

CharacterSet 932(Shift-JIS) 0x839F

CharacterSet 737(Greek) 0x80

If the CharacterSet property is set to 997 or 932, data will be printed using the Kanji font.

To print a single-byte character, please set the **CharacterSet** property to 737.

3.1.4 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.

3.1.5 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 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.

3.1.7 RecLineCharsList Property

Description

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

3.1.8 RecLineSpacing Property

Description

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

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.

3.1.9 RecLineWidth Property

Description

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

3.1.10 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.

3.1.11 RecSidewaysMaxChars Property**Description**

RecSidewaysMaxChars property is set to the following value, irrespective of the SetupPOS utility setting.

138 (FontA)

184 (FontB)

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 PageModeArea Property**Description**

PageModeArea property is set to the following value, irrespective of the SetupPOS utility setting.

512, 1662 (Paper width: 80mm)

360, 1662 (Paper width: 58mm)

3.1.14 DeviceEnabled Property

Description

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

In the following states, device initialization cannot be done:

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

When the **DeviceEnabled** property is set to TRUE, the printer state is notified via a **StatusUpdateEvent**.

If the **StatusUpdateEvent** for the printer stat is not defined in UPOS, however, the **StatusUpdateEvent** cannot be notified. In this case, the printer status can be found by examining the exception that is notified when the method is executed.

If the device initialization cannot be done when the **DeviceEnabled** property is set to TRUE, a device status is checked at an interval of 1 second, and it is repeated until the device initialization is performed completely.

The device initialization status can be found by enabling the **PowerNotify** property.

When StatusPowerOnline is notified by a **StatusUpdateEvent**, the initialization process is complete.

In addition, the initialization process may take several seconds depending on the connection speed and the image registration status.

3.2 Methods

The methods listed below differ from functions described in UPOS.

3.2.1 Claim Method

Description

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

3.2.2 Release Method

Description

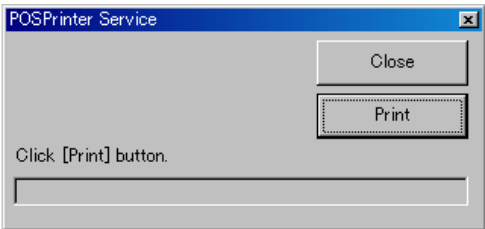
The connection is disconnected at the port where the device is connected.

3.2.3 CheckHealth Method

Description

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

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



Press the Print button to perform the test.

A test print of the following character strings is performed on the station currently selected.

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

Press the Close button to end the test.

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

level	Value	Meaning
HealthCheckLevel.Internal		
	Internal HCheck: Successful	The CheckHealth method finished normally.
	Internal HCheck: Error-<Message>	The CheckHealth method finished with an error. The Message contains error information.
HealthCheckLevel.External		
	External HCheck: Successful	The CheckHealth method finished normally.
	External HCheck: Error-<Message>	The CheckHealth method finished with an error. The Message contains error information.
HealthCheckLevel.Interactive		
	Interactive HCheck: Canceled	The CheckHealth method finished without doing anything.
	Interactive HCheck: Complete	After the last operation ended normally, the CheckHealth method finished.
	Interactive HCheck: Error-<Message>	After the last operation finished with an error, the CheckHealth method finished. The Message contains error information.

3.2.4 ClearOutput Method

Description

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

3.2.5 DirectIO Method

Description

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

Command	Outline of Function
PTR_DI_OUTPUT_NORMAL	Sends the specified code to the device using flow control.
PTR_DI_OUTPUT_REALTIME	Sends the specified code to the device without using flow control.
PTR_DI_PANEL_SWITCH	Enables/disables the panel switch.
PTR_DI_RECOVER_ERROR	Recovers from a recoverable error.
PTR_DI_PRINT_FLASH_BITMAP	Prints the bitmap saved to NVRAM.
PTR_DI_PRINT_FLASH_BITMAP2	Bitmaps registered in the NVRAM are selected by key code and printed.
PTR_DI_CODE128_TYPE	Specifies the default code for Code128.
PTR_DI_DELETE_NVIMAGE	Deletes the bitmap saved to NVRAM.
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_RING_BUZZER_WITH_TIME	Executes buzzer control.
PTR_DI_SOUND_MELODY	Play melody
PTR_DI_SET_BITMAP_PRINTING_TYPE	Specify the Bitmap print format

- **PTR_DI_OUTPUT_NORMAL Command**

Parameter

<i>command</i>	PTR_DI_OUTPUT_NORMAL
<i>data</i>	Not used
<i>object</i> (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

<i>command</i>	PTR_DI_OUTPUT_REALTIME
<i>data</i>	Not used
<i>object</i> (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.

In the case of a network connection, a command cannot be sent without using flow control. Therefore, an exception is thrown if this command is executed when the device is in a busy state.

● PTR_DI_PANEL_SWITCH Command

Parameter

<i>command</i>	PTR_DI_PANEL_SWITCH
<i>data</i>	Specify ON/OFF (0 is OFF and 1 is ON)
<i>object</i>	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

<i>command</i>	PTR_DI_RECOVER_ERROR
<i>data</i>	Not used
<i>object</i>	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.

In the case of a network connection, a command cannot be sent without using flow control. Therefore, an exception is thrown if this command is executed when the device is in a busy state.

- **PTR_DI_PRINT_FLASH_BITMAP Command**

Parameter

<i>command</i>	PTR_DI_PRINT_FLASH_BITMAP
<i>data</i>	Specify the number (1 to 255) of the bitmap to print.
<i>object</i> (String type)	Printing position (specify the number of the alignment parameter to use with the PrintBitmap method).

Description

Prints the bitmap in NVRAM that corresponds to the bitmap number specified for the *data* parameter.

If there is no bitmap saved to NVRAM, nothing is printed.

If the printer has no NVRAM bit image printing function, an exception is thrown. The value specified for the printing position is the same as that specified in the *alignment* parameter of the **PrintBitmap** method.

Use the TM-T88V utility to save to NVRAM.

The Save Images in NVRAM check box of SetupPOS Settings has no effect on this command.

If the stored image is larger than the available printable area or larger than the printable area specified with the alignment parameter, only the part inside the printable area is printed.

- **PTR_DI_PRINT_FLASH_BITMAP2 Command**

Parameter

<i>command</i>	PTR_DI_PRINT_FLASH_BITMAP2
<i>data</i>	Specify the Bitmap key code
<i>object</i>	Print position (specify the alignment parameter to use with the printBitmap method).

Description

Prints the NV graphic corresponding to the key code specified by the bitmap number. The key code is specified by storing the first part in bits 31 to 16 and the second part in bits 15 to 0 of pData.

The key code corresponds to the two digits used to write the NV graphic in the logo utility. The first digit is the first byte of the key code, and the second digit is the second byte. If the NV graphic corresponding to the specified key code is not registered, nothing is printed.

The printing position matches the value specified in the Alignment parameter of PrintBitmap, but the type is different. It is specified by converting the numeric data into a character string.

- Example: Centering
`object = int.Parse(PosPrinter.PrinterBitmapCenter);`
- Example: 100 dots from the left edge
`object = int.Parse(100)`
- Example: Specifying key code
`int data = 0;`
`data += 126;`
`data += 32 << 16;`

Data format:

31	16 15	0
0 0 0 0 0 0 0 0 0 1 0 0 0 0 0	0 0 0 0 0 0 0 0 0 1 1 1 1 1 0	
First byte of key code	Second byte of key code	

*Multi-tone printing can not be used when using the **RotatePrint** method with 90 degrees or using PageMode.

● PTR_DI_CODE128_TYPE Command

Parameter

<i>command</i>	PTR_DI_CODE128_TYPE
<i>data</i>	Specify one of the following. <ul style="list-style-type: none"> • PTR_DI_CODE_A • PTR_DI_CODE_B • PTR_DI_CODE_C
<i>object</i>	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_DELETE_NVIMAGE Command

Parameter

<i>command</i>	PTR_DI_DELETE_NVIMAGE
<i>data</i>	Specify the key code to delete
<i>object</i>	Not used

Description

Deletes the image of the key code specified for the 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 information is also deleted.

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

● PTR_DI_BINARY_CONVERSION Command

Parameter

<i>command</i>	PTR_DI_BINARY_CONVERSION
<i>data</i>	Specify one of the following. <ul style="list-style-type: none"> • PTR_DI_BC_NONE • PTR_DI_BC_NIBBLE • PTR_DI_BC_DECIMAL
<i>object</i>	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_SOUND_MELODY Command

Parameter

<i>command</i>	PTR_DI_SOUND_MELODY
<i>data</i>	Constant corresponding to the sound pattern
<i>object</i>	Specifies the number of repetitions for the sound, and the sound interval

Description

Plays the specified melody.

An exception is thrown if the **AsyncMode** property is set to TRUE.

Constant values that can be specified to the *data* parameter are as follows:

If an invalid value is specified, an exception will be thrown.

<i>data</i>	Meaning
PTR_DI_SOUND_PATTERN_1	Pattern A
PTR_DI_SOUND_PATTERN_2	Pattern B
PTR_DI_SOUND_PATTERN_3	Pattern C
PTR_DI_SOUND_PATTERN_4	Pattern D
PTR_DI_SOUND_PATTERN_5	Pattern E
PTR_DI_SOUND_PATTERN_ERROR	Pattern when an error occurs
PTR_DI_SOUND_PATTERN_NOPAPER	Pattern when paper out

The number of repetitions and the sound interval in the *object* parameter are separated by a comma as follows. (The format is: "repetitions, sound interval")

The sound interval is in milliseconds.

e.g. "5,1000" = 5 repetitions and a sound interval of 1 second

The valid range of the number of repetitions and the sound interval are as follows:

Number of repetitions: 1 ~ 255

Sound Interval: 100 ~ 60000 (Rounded off to the nearest 100ms)

If an invalid format or value is set, an exception will be thrown. If there is a space before and/or after the comma between the number of repetitions and the sound interval, it will be deemed as an invalid format and an exception will be thrown.

Specification of the sound interval is not available for all devices.

If a value is specified for the sound interval, it will be reset to 0. (The specified pattern is repeated for the specified number of repetitions without any interval).

If the optional external buzzer is not connected then it will not make a sound.

● PTR_DI_SET_BITMAP_PRINTING_TYPE Command

Parameter

<i>command</i>	PTR_DI_SET_BITMAP_PRINTING_TYPE
<i>data</i>	Constant indicating the print format for the specified bitmap
<i>object</i>	Not used

Description

Specifies the print format for bitmaps printed by printBitmap

Valid constants for the *data* parameter are as follows:

If a value other than the ones below is specified, an exception will be thrown.

*Multi-tone printing can not be used when using the **RotatePrint** method with 90 degrees or using PageMode.

<i>data</i>	Meaning
PTR_DI_BITMAP_PRINTING_NORMAL	Does not print a special bitmap
PTR_DI_BITMAP_PRINTING_MULTI_TONE	Multi-tone bitmap

If PTR_DI_BITMAP_PRINTING_MULTI_TONE is selected, graphics data will be displayed with richer gradation.

When PTR_DI_BITMAP_PRINTING_MULTI_TONE is selected, the BMP file input to printBitmap must be in 24-bit format.

If any other type of BMP file is input to printBitmap, an exception will be thrown.

If a Jpeg or Gif file is used with the **PrintBitmap** method, it is possible to print with gradation regardless of the file format.

If this command is not executed, the Bitmap print format will use the setting in SetupPOS.

Please refer to Sample Step16 for an example of how to use this program.

- **PTR_DI_GET_SUPPORT_FUNCTION Command**

Parameter

<i>command</i>	PTR_DI_GET_SUPPORT_FUNCTION
<i>data</i>	Not used
<i>object</i>	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.

- **PTR_DI_RING_BUZZER_WITH_TIME Command**

Parameter

<i>command</i>	PTR_DI_RING_BUZZER_WITH_TIME
<i>data</i>	Specifies the buzzer operating time (milliseconds).
<i>object</i>	Not used

Description

Sounds the buzzer for the time specified with the *data* parameter.

The settable buzzer operating time is 0 to 510 milliseconds.

If this command is executed while a drawer is connected, please use a drawer which has a kick pin of 2.

If you are use a drawer which has a kick pin of 5, the drawer will open when the buzzer sounds.

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 BeginRemoval Method

Description

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

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

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.

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	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)
- EAN128
- UPC-E
- UPC-A
- PDF417
- QRCode
- OTHER + 3
- OTHER + 4
- GS1-DataBar
- GS1-DataBar 128
- GS1-DataBar Expanded
- GS1-DataBar Stacked Omnidirectional
- GS1-DataBar Expanded Stacked
- OTHER + 3 (QR Code model1)
- OTHER + 4 (QR Code model2)
- OTHER + 5 (GS1-Data Truncated)
- OTHER + 6 (GS1-Data Limited)

- OTHER + 7 (GS1-Data Stacked)
- OTHER + 8 (GS1-Data Stacked Omnidirectional)
- OTHER + 9 (GS1-Data Expanded Stacked)
- 13172839 (PDF417, EAN-8)
- 13172840 (PDF417, EAN-13)
- 13172837 (PDF417, UPC-A)
- 13172838 (PDF417, UPC-E)
- 13172867 (PDF417, GS1-DataBar)
- 13173242 (PDF417, GS1-DataBar Truncated)
- 13173244 (PDF417, GS1-DataBar Stacked)
- 13173245 (PDF417, GS1-DataBar Stacked Omnidirectional)
- 13172869 (PDF417, GS1-DataBar Stacked Omnidirectional)
- 13173243 (PDF417, GS1-DataBar Limited)
- 13172868 (PDF417, GS1-DataBar Expanded)
- 13173246 (PDF417, GS1-DataBar Expanded Stacked)
- 13172870 (PDF417, GS1-DataBar Expanded Stacked)
- 13172856 (PDF417, GS1-DataBar 128)

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	180 dpi	180 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	180 dpi	180 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	384 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.

$$\text{Size} = ((\text{number of dots wide} + 7) \div 8) \times \text{number of dots high} + 8 + (\text{number of colors} - 1)$$

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.

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

<i>EventNumber</i>	PTR_DIE_RESPONSE
<i>Data</i>	0 (not used)
<i>Object</i>	Stores the response from the printer

Description

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

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

- **PTR_DIE_SET_BITMAP_MODE Event Number**

Property

<i>EventNumber</i>	PTR_DIE_SET_BITMAP_MODE
<i>Data</i>	Image save method
<i>Object</i>	Stores the key code

Description

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

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

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

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

3.3.2 ErrorEvent

Description

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

Appendix-A Revision history

A.1 EPSON OPOS ADK for .NET 1.14.6

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

A.2 EPSON OPOS ADK for .NET 1.12.17

- (1) Added support for the TM-T88V with a Bluetooth connection.

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) Added support for QR Code.

A.4 Differences from the TM-T88IV

- (1) Added "CharacterSet" setting to SetupPOS.
- (2) Added ability to set PTR_CS_UNICODE for the **CharacterSet** property.
- (3) Removed the "Enable Two Color Printing Check Box" from SetupPOS.
- (4) Added the Multi-tone printing feature.
- (5) Added the Optional external buzzer.

Appendix-B SetupPOS Settings

The screenshot shows the 'Device Details' tab in the SetupPOS application. The 'Common' section contains the following settings:

- ☒ Ink on Paper for Completion
- ☒ CharacterSet Matches Device
- ☐ Save Images in NVRAM
- Receipt Characters per Line: 42
- Receipt Line Spacing (dots): 30
- CharacterSet: 997
- Receipt Width: 80
- Halftone Method: Threshold
- Device Font Type: Alphanumeric
- Gradation: Normal

The above screen is for the TM-T88V.

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 when the value of the CharacterSet property is other than 932.

Default: checkmark added

B.3 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.4 Receipt Characters per Line Combo Box

Description

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

Item	Meaning
In case of Receipt Width 80mm	
42	42 characters will be printed on one line.
56	56 characters will be printed on one line.

Default: 42

In case of Receipt Width 58mm	
30	30 characters will be printed on one line.
40	40 characters will be printed on one line.

Default: 30

B.5 Receipt Line Spacing (dots) Text Box

Description

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

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

Default: 30

B.6 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.7 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

B.8 Halftone Method Combo Box

Description

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

Item	Meaning
Threshold	Uses the threshold method (monochrome conversion) on the specified image file, and then outputs it to the device.
Error Diffusion	Performs error diffusion processing on the specified image file, and then outputs it to the device.
Dithering	Performs dithering processing on the specified image file, and then outputs it to the device.

Default: Threshold

B.9 Device Font Type Combo Box

Description

Sets the multi-byte character font of the device.

Item	Meaning
Alphanumeric	The device has no multi-byte character font.
Japanese	The device has a Japanese font.

Default: Alphanumeric

B.10 Gradation Combo Box

Description

Specifies the initial value of the print format for bitmaps printed by **printBitmap** method.

Refer to the description of the **directIO** method "PTR_DI_SET_BITMAP_PRINTING_TYPE Command" for details.

*Multi-tone printing can not be used when using the RotatePrint method with 90 degrees or using PageMode.

Item	Meaning
Normal	Does not print a special bitmap.
Multi Tone	Prints a Multi-tone bitmap.

Default: Normal

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

DIP-SW 2

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

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

DIP Switch 1 Parity Settings

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

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

DIP Switch 1 Transmission Speed Switching

SW1-7	SW1-8	Baud Rate (bps)
ON	ON	38400 (see *1)
OFF	ON	4800
ON	OFF	9600
OFF	OFF	19200

*1:

- The default value of the transmission speed is 9600 bps.
- The transmission speed can be selected by setting the transmission condition of the serial interface.
- The setting of the communication condition of the serial interface is performed with **GS (E)**. As for each setting value, see **GS (E)** for details.

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

2) Parallel connection

DIP-SW 1

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

Recommended
Fixed to OFF
Recommended
Fixed to OFF
Fixed to OFF
Fixed to OFF
Fixed to OFF
Fixed to OFF

DIP-SW 2

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

Fixed to ON
Fixed to OFF
Settable ^{Note 1}
Settable ^{Note 1}
Fixed to OFF
Fixed to OFF
Fixed to OFF
Fixed to ON

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

3) USB connection Supported and Network connection

DIP-SW 1

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

Fixed to OFF
Fixed to OFF
Fixed to OFF
Fixed to OFF
Fixed to OFF
Fixed to OFF
Fixed to OFF
Fixed to OFF

DIP-SW 2

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

Recommended
Fixed to OFF
Settable ^{Note 1}
Settable ^{Note 1}
Fixed to OFF
Fixed to OFF
Fixed to OFF
Fixed to ON

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

4) Bluetooth connection**- TM-T88V with iOS Bluetooth**

DIP-SW 1

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

DIP-SW 2

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

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

- TM-T88V with UB-B03

DIP-SW 1

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

DIP-SW 2

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

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

Appendix-D Default Values of Properties

● Common Settings

Property	Setting Value/Default Value	Range of Settings
CapCompareFirmwareVersion	false	—
CapPowerReporting	(Serial/Bluetooth 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-T88V Printer"	—
DeviceName	"TM-T88V"	—
State	ControlState.Idle	—
AsyncMode	false	true, false
CapCharacterSet	CharacterSetCapability.Unicode	Refer to "Settings Affecting Changing of Language".
CapConcurrentJrnRec	false	—
CapConcurrentJrnSlp	false	—
CapConcurrentRecSlp	false	—
CapConcurrentPageMode	false	—
CapCoverSensor	true	—
CapMapCharacterSet	false	—
CapTransaction	true	—
CartridgeNotify	PrinterCartridgeNotify.Disabled	—
CharacterSet	CharacterSetCapability.Unicode	Refer to the SetupPOS Setting "CharacterSet Combo Box".
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.None	—
CapRecColor	PrinterColors.Primary	—
CapRecDhigh	true	—
CapRecDwide	true	—
CapRecDwideDhigh	true	—
CapRecEmptySensor	true	—
CapRecItalic	false	—
CapRecLeft90	true	—
CapRecMarkFeed	PrinterMarkFeeds.None	—
CapRecNearEndSensor	true	—
CapRecPageMode	true	—
CapRecPapercut	true	—
CapRecPresent	true	—
CapRecRight90	true	—
CapRecRotate180	true	—
CapRecStamp	false	—
CapRecUnderline	true	—
RecBarCodeRotationList	PrintRotation.Normal, PrintRotation.Right90, PrintRotation.Left90, PrintRotation.Rotate180	—
RecBitmapRotationList	PrintRotation.Normal, PrintRotation.Right90, PrintRotation.Left90, PrintRotation.Rotate180	—
RecCurrentCartridge	PrinterColors.Primary	—
RecCartridgeState	PrinterCartridgeStates.Unknown	—
RecEmpty	false	—
RecLetterQuality	false	true, false
RecLineChars	Refer to “Settings Affecting Changing of Paper Width”.	Refer to “Settings Affecting Changing of Paper Width”.
RecLineCharsList	Refer to “Settings Affecting Changing of Paper Width”.	—
RecLineHeight	24	The font height is adjusted to that of FontA or FontB specified in RecLineChars.
RecLineSpacing	30	1 to 255
RecLinesToPaperCut	5 Changing RecLineSpacing configures the setting as follows. $\text{RecLinesToPaperCut} = 145 \div \text{RecLineSpacing}$ (If the above calculation generates a remainder, perform the following calculation: $\text{RecLinesToPaperCut} = \text{RecLinesToPaperCut} + 1$)	—
RecLineWidth	Refer to “Settings Affecting Changing of Paper Width”.	Refer to “Settings Affecting Changing of Paper Width”.
RecNearEnd	false	—
RecSidewaysMaxChars ^{Note 1}	138 (Font A) 184 (Font B)	—
RecSidewaysMaxLines	Refer to “Settings Affecting Changing of Paper Width”.	—

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

● **Settings Affecting Changing of Language**

Language	Property	Setting Value/Default Value	Range of Settings
ANK	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	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
80 mm	RecLineChars	42 Changes depending on the SetupPOS setting "Receipt Characters Per Line Combo Box"	1 to 56 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	42, 56	—
	RecLineWidth	512	—
	RecSidewaysMaxLines	The value resulting from the following calculation is set (after rounding it down to the nearest whole number). $((\text{Value of RecLineWidth} - 22 \text{ dots}) \div (\text{the largest value of RecLineSpacing and RecLineHeight})) + 1.$	—
58 mm	RecLineChars	30 Changes depending on the SetupPOS setting "Receipt Characters Per Line Combo Box"	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	—
	RecLineWidth	360	—
	RecSidewaysMaxLines	The value resulting from the following calculation is set (after rounding it down to the nearest whole number). $((\text{Value of RecLineWidth} - 22 \text{ dots}) \div (\text{the largest value of RecLineSpacing and RecLineHeight})) + 1.$	—

● **Settings Related to PageMode**

Paper Width	Property	Setting Value/Default Value	Range of Settings
80 mm	PageModeArea	"512,1662"	—
	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 <= 512 Y + Height <= 1662
	PageModePrintDirection	PageModePrintDirection.None	PageModePrintDirection.BottomToTop, PageModePrintDirection.LeftToRight, PageModePrintDirection.RightToLeft, PageModePrintDirection.TopToBottom
	PageModeVerticalPosition	0	0 or more
58 mm	PageModeArea	"360,1662"	—
	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 <= 360 Y + Height <= 1662
	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-T88V	ESC #P	0 to 100 (100)
	ESC #P	0 to 100 (100)
	ESC #sP	—
	ESC sL	—
	ESC #B	1 to 20
	ESC tL	0
	ESC bL	0
	ESC #F	0 to 9999 (1)
	ESC #uF	0 to 9999 (1)
	ESC #rF	—
	ESC #E	0 to 999 (1)
	ESC #T	—
	ESC bC	0
	ESC #uC	0 to 2 (1)
	ESC iC	—
	ESC #C	Plain paper 1
	ESC rvC	0
	ESC #sC	—
	ESC 1C	0
	ESC 2C	0
	ESC 3C	0
	ESC 4C	0
	ESC #hC	1 to 8 (1)
	ESC #vC	1 to 8 (1)
	ESC tbC	—
	ESC tpC	—
	ESC cA	0
	ESC rA	0
	ESC lA	0
	ESC N	0
	ESC #R	1 to 999999999
	ESC #stC	0 to 1 (0)

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

Appendix-F DeviceStatistics

TM-T88V

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