

**EPSON OPOS ADK for .NET Manual**

# **Application Development Guide**

**POSPrinter  
(TM-P20II)**

Version 1.14.24 Jun. 2022

## Notes

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# Chapter 1 Introduction

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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 .NETVersion 1.14.24" 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.

## **1.2 About the target models of this manual**

The models covered by this manual are as follows.

- TM-P20II
- TM-P20II\_MltFont

## Chapter 2 Before Using POSPrinter

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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 use the SetupPOS utility, refer to the User's Reference Guide and "[Appendix-B SetupPOS Settings](#)".

### 2.2 Precautions and Restrictions

- Not all Unicode characters can be printed even if 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 character 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.
- 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  $\pm 1$  may be produced in the property and the parameter of the method affected by the **MapMode** property.
- Only a value described in the **RecLineCharsList** property can be set in the

**RecLineChars** property. If a value other than a value described in the **RecLineCharsList** property is set, the value is set to the nearest value that is smaller in the **RecLineCharsList** property. However, an exception is thrown if a value larger than the largest value described in the **RecLineCharsList** 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.
- The capacity of NVRAM for storing images differs depending on the settings of the device. Be extremely careful when replacing devices because the capacity of NVRAM for storing images is not considered at the ServiceObject.

## Chapter 3 Properties, Methods, and Events

---

### 3.1 Properties

The properties listed below differ from functions described in UPOS.

#### 3.1.1 CapPowerReporting Property

##### Description

Identifies the reporting capabilities of the device.

One of the following values is set.

Value	Meaning
PowerReporting.Standard	The value set when a 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 USB or 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.

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.

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.

In case of MultiFont registration, set **CharacterSet** property and change priority font.

### 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 MapCharacterSet Property

#### Description

Regardless of the **MapCharacterSet** property value, the Service perform mapping.

### 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  $\pm 1$  may be produced in the property and the parameter of the method affected by the **MapMode** property.

### 3.1.7 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.

### 3.1.8 RecLineHeight Property

#### Description

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

When **RecLineChars** property set 42, it is possible to change **RecLineHeight** property into the following values.

**RecLineHeight=24**

**RecLineHeight=17**

However, **RecLineHeight** property is certainly set as 24 immediately after changing **RecLineChars** property into 42.

### 3.1.9 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.

### 3.1.10 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.

### **3.2.2 Release Method**

#### **Description**

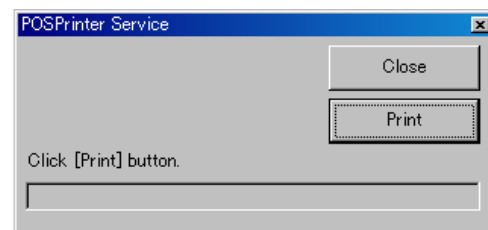
The connection is disconnected at the port where the device is connected.

### 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 <b>CheckHealth</b> method finished normally.
	Internal HCheck: Error-<Message>	The <b>CheckHealth</b> method finished with an error. The Message contains error information.
HealthCheckLevel.External		
	External HCheck: Successful	The <b>CheckHealth</b> method finished normally.
	External HCheck: Error-<Message>	The <b>CheckHealth</b> method finished with an error. The Message contains error information.
HealthCheckLevel.Interactive		
	Interactive HCheck: Canceled	The <b>CheckHealth</b> method finished without doing anything.
	Interactive HCheck: Complete	After the last operation ended normally, the <b>CheckHealth</b> method finished.
	Interactive HCheck: Error-<Message>	After the last operation finished with an error, the <b>CheckHealth</b> 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_BITMAP2	Prints the bitmap saved to NVRAM.
PTR_DI_DELETE_NVIMAGE	Deletes the bitmap saved to NVRAM.
PTR_DI_CODE128_TYPE	Specifies the default code for Code128.
PTR_DI_BINARY_CONVERSION	Specifies the character string format specified in the parameter of the string type.
PTR_DI_GET_SUPPORT_FUNCTION	Returns the functions supported by the device currently connected.
PTR_DI_HARDWARE_RESET	Resets the device.
PTR_DI_RING_BUZZER	Executes buzzer control.
PTR_DI_GET_BATTERY_STATUS	Retrieves the current battery status.
PTR_DI_GET_OFFLINE_CONDITION	Acquires the printer status.

- **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.



### ● 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.

- **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 <b>PrintBitmap</b> 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	

## ● 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 *data* parameter from NVRAM.

Use the key code reported by the **DirectIOEvent** event when **SetBitmap** is executed.

If the key code is specified by PTR\_DI\_DELETE\_ALL, all the images saved to NVRAM are deleted.

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

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

## ● PTR\_DI\_CODE128\_TYPE Command

### Parameter

---

<i>command</i>	PTR_DI_CODE128_TYPE
<i>data</i>	Specify one of the following. <ul style="list-style-type: none"> <li>• PTR_DI_CODE_A</li> <li>• PTR_DI_CODE_B</li> <li>• PTR_DI_CODE_C</li> </ul>
<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\_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"> <li>• PTR_DI_BC_NONE</li> <li>• PTR_DI_BC_NIBBLE</li> <li>• PTR_DI_BC_DECIMAL</li> </ul>
<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 [255])
- **PrintImmediate** method (only when the **CharacterSet** property is a blank page [255])

- **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 defined function flags are as follows.

<b>Function Flag</b>	<b>Meaning</b>
PTR_DI_BATTERY	Includes a function for notifying of battery status.

- **PTR\_DI\_HARDWARE\_RESET Command**

**Parameter**


---

<i>command</i>	PTR_DI_HARDWARE_RESET
<i>data</i>	Not used
<i>object</i>	Not used

**Description**

Resets the device.

If this command is used, behavior of this software is the same as if the device has been turned off and then on.

This command cannot be used when there is a Bluetooth connection.

- **PTR\_DI\_RING\_BUZZER Command**

**Parameter**


---

<i>command</i>	PTR_DI_RING_BUZZER
<i>data</i>	Specify the buzzer tone type.
<i>object</i>	Not used

**Description**

The buzzer tone sounds in accordance with the value specified for the *data* parameter.

The values that can be specified for the *data* parameter and their corresponding tones are as follows.

**Value (Decimal) Buzzer Tone**


---

48	Mute
49	1280 Hz tone sounds for 1000 msec
50	4100 Hz tone sounds for 1000 msec
51	1280 Hz tone sounds for 200 msec
52	4100 Hz tone sounds for 200 msec
53	1280 Hz tone sounds for 200 msec → mutes for 200 msec → sounds for 200 msec
54	4100 Hz tone sounds for 200 msec → mutes for 200 msec → sounds for 200 msec
55	1280 Hz tone sounds for 500 msec
56	4100 Hz tone sounds for 500 msec
57	1280 Hz tone sounds for 200 msec → mutes for 200 msec → sounds for 200 msec → mutes for 200 msec → sounds for 200 msec
58	4100 Hz tone sounds for 200 msec → mutes for 200 msec → sounds for 200 msec → mutes for 200 msec → sounds for 200 msec

- **PTR\_DI\_GET\_BATTERY\_STATUS Command**

**Parameter**


---

<i>command</i>	PTR_DI_GET_BATTERY_STATUS
<i>data</i>	Not used
<i>object</i>	Not used

**Description**

Retrieves the battery status of the device.

Indicates the battery status with the logical OR of the status flag, and stores the returned value in the Data property of DirectIOData.

The defined status flags are as follows.

<b>Status Flag</b>	<b>Meaning</b>
PTR_DI_POWERED_BY_AC	Being powered by AC power source
PTR_DI_POWERED_BY_BATTERY	Being powered by battery
PTR_DI_BATTERY_FULL	The battery level is sufficiently high
PTR_DI_BATTERY_NEAR_MIDDLE	The battery level is nearly middle
PTR_DI_BATTERY_MIDDLE	The battery level is middle
PTR_DI_BATTERY_NEAR_LOW	The battery level is nearly low
PTR_DI_BATTERY_LOW	The battery level is low
PTR_DI_BATTERY_NEAR_EMPTY	The battery level is very low and charging is required, but the device is still operable
PTR_DI_BATTERY_CLOSE_EMPTY	The battery is close to empty and the device is inoperable

- **PTR\_DI\_GET\_OFFLINE\_CONDITION Command**

**Parameter**


---

<i>command</i>	PTR_DI_GET_OFFLINE_CONDITION
<i>data</i>	Not used
<i>object</i>	Not used

**Description**

Acquires the status of the currently connected printer from the device and stores the return value in the Data property of DirectIOData.

Constants that can be specified for the *Data* parameter are shown below.

Constants that can be specified for the data parameter are shown below.

**Value**
**Meaning**


---

PTR_DI_CONDITION_ONLINE	Online
PTR_DI_CONDITION_RECEIPT_ONLY_OFFLINE	Receipt station is offline operations that do not involve printing can be executed.
PTR_DI_CONDITION_RECOVERBLE	Printer is in an error state; Recovery possible by recovery command.
PTR_DI_CONDITION_UNRECOVERBLE	Printer is in an error state; recovery only possible by rebooting the printer.



### 3.2.6 ResetStatistics Method

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

#### Parameter

---

*Microsoft.PointOfService.StatisticCategories*

Specify one of the following.

- `StatisticCategories.UpoS`
- `StatisticCategories.Manufacturer`
- `StatisticCategories.All`

#### Description

Of the items included in the specified category, only the items for which O appeared for the permission reset in "[Appendix-E 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-E 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-E 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
<i>String[]</i>

**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-E 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.Upas`
- `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-E 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 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-D Escape Sequences](#)” for escape sequences supported by this device.

### 3.2.13 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-D Escape Sequences](#)” for escape sequences supported by this device.

### 3.2.14 RotatePrint Method

#### Description

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 | 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.

### 3.2.15 PrintBarcode Method

#### Description

Although both of the following affect rotated printing, settings made with the **RotatePrint** method take priority.

In other words, the **RotateSpecial** property setting is ignored when rotated printing of barcodes is specified with the **RotatePrint** method.

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

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

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

- CODE128
- CODE128 Parsed
- CODE93
- CODABAR
- ITF
- CODE39
- JAN13 (EAN13)
- JAN8 (EAN8)
- UPC-E
- UPC-A
- PDF417
- QR Code (QR Code Model 2)
- Maxi Code
- OTHER + 3 (QR Code Model 1)
- OTHER + 4 (QR Code Model 2)
- GS1-DataBar
- GS1-DataBar 128
- GS1-DataBar Expanded
- GS1-DataBar Stacked Omnidirectional
- GS1-DataBar Expanded Stacked
- Aztec Code
- Data Matrix Code
- 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)

Supplementary information on CODE128 and CODE128 Parsed:

If the data does not contain a special character ("{"), size optimization will be performed.

In this case, the check of the Width parameter before printing is ignored.

As a result, if the barcode has too much data and exceeds the paper width, it may be fed without printing anything.

An example is shown below.

<b>Data (example)</b>	<b>Size optimization</b>	<b>Width check</b>
1234567890	O	x
{C1234567890	x	O
O: Applicable		
x: Not applicable		



**3.2.16 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

**3.2.17 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

**3.2.18 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 NVRAM and volatile memory. Use SetupPOS to set whether to download to NVRAM.

**3.2.19 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

### **3.2.20 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.

### 3.2.21 PageModePrint Method

#### Description

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

<b>control</b>	<b>Methods</b>	<b>Mode</b>
PageModePrintControl.PageMode	<b>RotatePrint</b>	PageModePrint

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

- 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 l (printer ID of 1 byte)
- GS r
- DLE EOT
- DLE DC4 (specified status)
- GS ( C
- GS ( L
- GS 8 L
- GS ( G

When a network connection is being used and the “Ink on Paper for Completion” check box of “Appendix-B SetupPOS Settings” is selected, this event cannot notify of the response from the printer.

- **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.

<b>Data</b>	<b>Meaning</b>
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** 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.

### 3.3.3 StatusUpdateEvent

#### Description

When the validation status is received from the device, Epson's enhanced **StatusUpdateEvent** event is reported.

The event generated and its meaning are shown below.

- **When Powered by an AC Power Source**

The following **StatusUpdateEvent** event notifies that the device is powered by an AC power supply and whether or not a battery is attached.

Value	Meaning
PTR_SUE_POWERED_BY_AC	Being powered by AC power source
PTR_SUE_BATTERY_OK	A battery cartridge is attached

- **When Powered by a Battery**

The following **StatusUpdateEvent** event notifies that the device is powered by a battery and indicates the battery level.

Value	Meaning
PTR_SUE_POWERED_BY_BATTERY	Being powered by battery
PTR_SUE_BATTERY_FULL	The battery level is sufficiently high
PTR_SUE_BATTERY_NEAR_MIDDLE	The battery level is nearly middle
PTR_SUE_BATTERY_MIDDLE	The battery level is middle
PTR_SUE_BATTERY_NEAR_LOW	The battery level is nearly low
PTR_SUE_BATTERY_LOW	The battery level is low
PTR_SUE_BATTERY_NEAR_EMPTY	The battery level is very low and charging is required
	The device is operable
PTR_SUE_BATTERY_CLOSE_EMPTY	The battery is close to empty and the device is inoperable

## Chapter 4 MultiFont Printing

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### 4.1 Overview

This function enables multilingual printing. The function is enabled by registering the target model, with SetupPOS.

### 4.2 Supported Methods

- **PrintNormal**
- **PrintImmediate**
- **SetLogo**

### 4.3 Supported Languages

- ANK
- Japanese
- Korean
- Simple Chinese
- Traditional Chinese
- Thai

## 4.4 Details of function

### 4.4.1 Priority Font

ServiceObject searches the print character code points in the following priority order. The following is the default analysis priority of the language font.

Language Font	Analysis priority
ANK Font	1: priority : High
Japanese Font	2:
Korean Font	3:
Traditional Chinese Font	4:
Simple Chinese Font	5: priority : Low

Thai is treated the same as ANK font.

Therefore, even if the code point is the same, the typeface for each language may differ as shown below.

CodePoint	Japanese	Simple Chinese	Traditional Chinese	Korean
U+9AA8	骨	骨	骨	骨

As a result, depending on the analysis priority of the language font, printing may be performed in a typeface different from the typeface assumed by the application developer.

To avoid this, change the CharacterSet property in your application. Priority Font can be set as follows.

	932 Japanese	936 Simple Chinese	949 Korean	950 Traditional Chinese	Other
First priority Font	Japanese Font	Simple Chinese Font	Korean Font	Traditional Chinese Font	ANK Font
Second priority Font	ANK Font	ANK Font	ANK Font	ANK Font	Japanese Font



#### 4.4.2 Precautions and Restrictions

- When using the following functions, set the same value as the character code value specified in SetupPOS to the **CharacterSet** property.
  - RotatePrint
  - PageModePrint
  - Specify a character string that combines multiple ESC | IA, ESC | cA, and ESC | rA in one **PrintNormal** method.

If the settings are incorrect, the following phenomena will occur.

- The margin on the right edge becomes wider
  - Line breaks at unintended positions
- Strikethrough function of escape sequence (ESC | #stC) is not supported.
  - If you want to use "U + 005C" as a half-width yen sign instead of a backslash, set the printer's international character set to "Japan" with the utility.

## **Appendix-A Revision history**

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### **A.1 EPSON OPOS ADK for .NET 1.14.24**

(1) TM-P20II is supported.

## Appendix-B SetupPOS Settings

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### B.1 Registered name

If you use MultiFont printing, select the device of "MltFont" in SetupPOS.

e.g.:TM-P20II

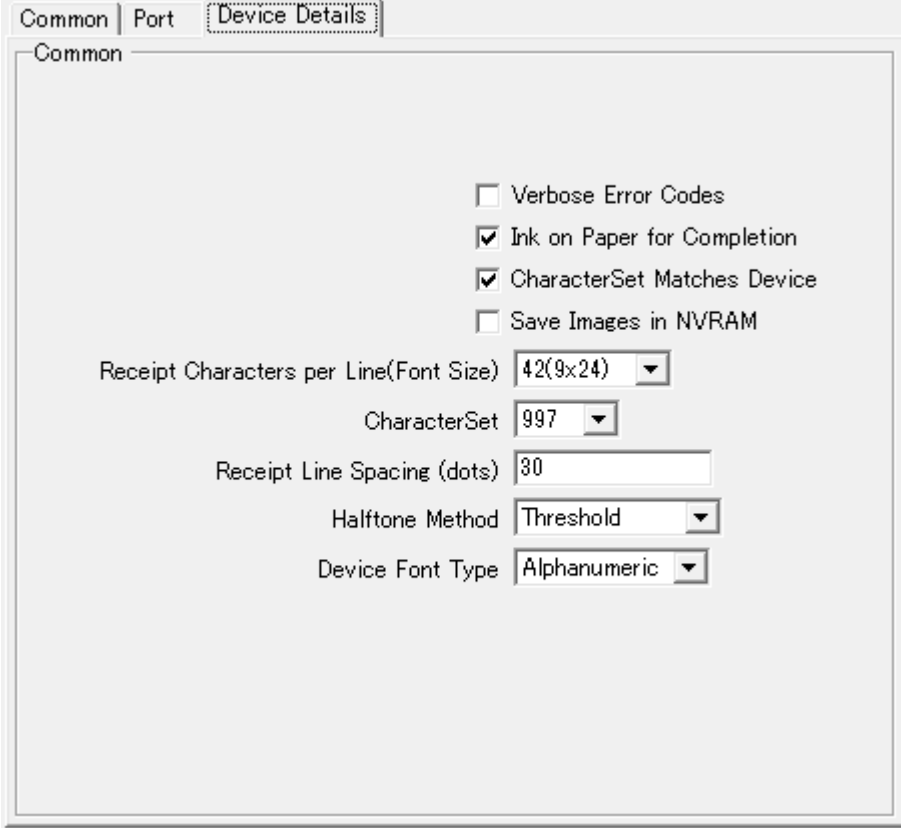
Use MultiFont printing: Select "TM-P20II\_MltFont"

Not use MultiFont printing: Select "TM-P20II"

### B.2 Device Setting

Below is the device setting screen.

The selections differ depending on the registered device, but the settings are the same.



The screenshot shows the 'Device Details' tab in the SetupPOS application. The 'Common' sub-tab is selected. The settings are as follows:

- ☐ Verbose Error Codes
- ☒ Ink on Paper for Completion
- ☒ CharacterSet Matches Device
- ☐ Save Images in NVRAM
- Receipt Characters per Line(Font Size): 42(9x24)
- CharacterSet: 997
- Receipt Line Spacing (dots): 30
- Halftone Method: Threshold
- Device Font Type: Alphanumeric

### B.2.1 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 a network connection.

### B.2.2 Ink on Paper for Completion Check Box

#### Description

Sets whether to check that printing operation is complete.

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

- **When set to judge method output to be complete when the device completes printing**

Printing on the device and the printing method are not completely synchronized. The method can be completed quickly.

If the value of the **AsyncMode** property is set to true, the completion of printing is reported before the device actually completes printing because the **OutputCompleteEvent** event considers the printing method to be complete when the data output is complete.

Printing is judged to be successful if method output completes even when an error was generated on the device during printing.

**Default:** checkmark added

### B.2.3 CharacterSet Matches Device Check Box

#### Description

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

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

**Default:** checkmark added

### B.2.4 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.2.5 Receipt Characters per Line Combo Box****Description**

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

<b>Item</b>	<b>Meaning</b>
32(12x24)	32 characters will be printed on one line. (Default: FontA)
38(10x24)	38 characters will be printed on one line. (Default: FontD)
42(9x17)	42 characters will be printed on one line. (Default: FontC)
42(9x24)	42 characters will be printed on one line. (Default: FontB)
48(8x16)	48 characters will be printed on one line. (Default: FontE)

**Default:** 42(9x24)

## B.2.6 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.
932	MultiFont registration: - Set the initial value of the priority font to Japanese. Without multiFont registration: - Only when DeviceFontType is set to "Japanese".
936	MultiFont registration only. MultiFont registration only. Set the initial value of the priority font to Simplified Chinese.
949	MultiFont registration only. Set the initial value of the priority font to Korean.
950	MultiFont registration only. Set the initial value of the priority font to Traditional Chinese.
437, 720, 737, 775, 850, 851, 852, 853, 855, 857, 858, 860, 861, 862, 863, 864, 865, 866, 869, 932, 998, 999, 1098, 1125, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258	Printed with the standard code page.
120, 121, 126, 130, 131, 150, 151, 152, 153, 154, 155, 255	Printed with the Device-specific Character CodePage.
<b>Default:</b> 997	

**B.2.7 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.2.8 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.2.9 Device Font Type Combo Box****Description**

Sets the multi-byte character font of the device.

Only selectable for without multifont registration.

<b>Item</b>	<b>Meaning</b>
Alphanumeric	The device has no multi-byte character font.
Japanese	The device has a Japanese font.

**Default:** Alphanumeric

## Appendix-C Default Values of Properties

### ● Common Settings

Property	Setting Value/Default Value	Range of Settings
CapCompareFirmwareVersion	False	—
CapPowerReporting	(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	Refer to “Device Specific Property Settings”.	—
DeviceName	Refer to “Device Specific Property Settings”.	—
State	ControlState.Idle	—
AsyncMode	False	True, False
CapCharacterSet	CharacterSetCapability.Unicode	—
CapConcurrentJrnRec	False	—
CapConcurrentJrnSlp	False	—
CapConcurrentRecSlp	False	—
CapConcurrentPageMode	False	—
CapCoverSensor	True	—
CapMapCharacterSet	True	—
CapTransaction	True	—
CartridgeNotify	PrinterCartridgeNotify.Disabled	—
CharacterSet	CharacterSetUnicode	One of the values in CharacterSetList.
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	"384,2400"	—
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 <= 384 Y + Height <=2400
PageModePrintDirection	PageModePrintDirection.None	PageModePrintDirection.BottomToTop, PageModePrintDirection.LeftToRight, PageModePrintDirection.RightToLeft, PageModePrintDirection.TopToBottom
PageModeStation	PrinterStation.None	PrinterStation.Receipt
PageModeVerticalPosition	0	0 or more
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	False	—
CapRecPageMode	True	—
CapRecPapercut	False	—
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	(FontB) 42	1 to 48 Characters 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	32,42,38,48	—
RecLineHeight	(FontA) 24 (FontB) 24 (FontC) 17 (FontD) 24 (FontE) 16	The font height is adjusted to that of FontA, FontB, FontC, FontD or FontE specified in RecLineChars.
RecLineSpacing	30	1 to 255
RecLinesToPaperCut	4 Changing RecLineSpacing involves configuring the setting as follows. $\text{RecLinesToPaperCut} = 103 \div \text{RecLineSpacing}$ (If the above calculation generates a remainder, perform the following calculation: $\text{RecLinesToPaperCut} = \text{RecLinesToPaperCut} + 1$ )	—
RecLineWidth	384	—

RecNearEnd	False	—
RecSidewaysMaxChars	(FontA) 200 (FontB) 266 (FontC) 266 (FontD) 240 (FontE) 300	—
RecSidewaysMaxLines	The value resulting from the following calculation is set (after rounding it down to the nearest whole number). $((\text{Value of RecLineWidth} - 21 \text{ dots}) \div (\text{the largest value of RecLineSpacing and RecLineHeight})) + 1.$	—

- **Device Specific Property Settings**

Device	Property	Setting Value/Default Value	Range of Settings
TM-P20II	DeviceDescription	"EPSON TM-P20II Printer"	—
	DeviceName	"TM-P20II"	—
TM-P20II_MltFont	DeviceDescription	"EPSON TM-P20II_MltFont Printer"	—
	DeviceName	"TM-P20II_MltFont"	—

- **Settings Affecting Changing of CharacterSet**  
**MultiFont registration**

Language	Property	Setting Value/Default Value	Range of Settings
-	CharacterSetList	120,121,126,130,131,150,151,152,153,154,155,437,720,737,775,850,851,852,853,855,857,858,860,861,862,863,864,865,866,869,932,936,949,950,997,998,999,1098,1125,1250,1251,1252,1253,1254,1255,1256,1257,1258	—

**Without multiFont registration**

Language	Property	Setting Value/Default Value	Range of Settings
ANK	CharacterSetList	120,121,126,130,131,150,151,152,153,154,155,255,437,720,737,775,850,851,852,853,855,857,858,860,861,862,863,864,865,866,869,997,998,999,1098,1125,1250,1251,1252,1253,1254,1255,1256,1257,1258	—
Japanese	CharacterSetList	120,121,126,130,131,150,151,152,153,154,155,255,437,720,737,775,850,851,852,853,855,857,858,860,861,862,863,864,865,866,869,932,997,998,999,1098,1125,1250,1251,1252,1253,1254,1255,1256,1257,1258	—

- **Settings Related to Font**

Font Name	Font Size(Width x Height)	RecLineChars	RecLineHeight
FontA	12 x 24	32	24
FontB	9 x 24	42	24
FontC	9 x 17	42	17
FontD	10 x 24	38	24
FontE	8 x 16	48	16

## Appendix-D Escape Sequences

The following figure is about supported/unsupported Escape Sequences.

Escape Sequence	Range of Settings
ESC #P	—
ESC #P	0 to 100 (100)
ESC #sP	—
ESC sL	—
ESC #B	1 to 20
ESC tL	O
ESC bL	O
ESC #F	0 to 9999 (1)
ESC #uF	0 to 9999 (1)
ESC #rF	—
ESC #E	0 to 999 (1)
ESC #T	—
ESC bC	O
ESC #uC	0 to 2 (1)
ESC iC	—
ESC #rC	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 #fC	—
ESC tbC	—
ESC tpC	—
ESC cA	O
ESC rA	O
ESC IA	O
ESC N	O
ESC #R	1 to 999999999
ESC #stC	MultiFont registration: — Without multiFont registration: 0 to 1 (1)
ESC #dL	—

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

## Appendix-E DeviceStatistics

XML Definition Name	Description	Reset Permission	Update Permission
UnifiedPOSVersion	UPOS version	x	x
DeviceCategory	Device category	x	x
ManufactureName	Manufacturer name	x	x
ModelName	Device name	x	x
SerialNumber	Serial number	x	x
ManufactureDate	Manufacture date	x	x
MechanicalRevisionRevision	Device revision	x	x
FirmwareRevisionRevision	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	X	x
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	x	x
FailedPaperCutCount	Paper cut failure count	x	x
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