CITIZEN JavaPOS DRIVER 1.11 Application Development Guide

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CITIZEN SYSTEMS JAPAN CO., LTD.

更新履歴

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1. Introduction

This driver complies with JavaPOS1.11.   This document provides the explanation of device (POS printer)-dependent specifications and precautions.   When you want to develop applications by using this driver, refer to "Java for Retail POS Programming Guide" beforehand.

1.1. CITIZEN JavaPOS Driver

This driver provides an open device driver architecture that can easily integrate the CITIZEN POS printer and the cash drawer connected to it by the POS system based on Java.   This driver has been developed for the following purpose.
- Definition of architecture for accessing the Java-based POS printer and cash drawer connected to it
- Definition of interface of CITIZEN POS printer supporting POS solution and cash drawer connected to it

1.2. Application Developer

Application developer who wants to use this driver must be familiar with the following items.
- JavaPOS1.11 specifications
- General characteristics of CITIZEN POS printer
- Terms and structure of Java
- Java development environment

1.3. CITIZEN JavaPOS Driver Precautions

- When printing on label paper, use MarkFeed method (handling of marked paper).
- Please note that proper operation is not guaranteed at the environment where OPOS driver by other company is installed.
- Also refer to the notes in each chapter.

2. Operating Environment

2.1. Object Operating System

This driver supports the following Windows operating systems.
- Windows XP
- Linux

2.2. Object Models

Object models of this driver and the corresponding drivers are as shown below.
For details of each model, refer to the Printer User's Guide.

2.2.1 Applicable driver (Windows)

Series of Model	OS	Interface	Logical Name
CBM-1000II	Windows	Serial	CITIZEN 1000II Serial Windows CITIZEN 1000II Cash Drawer 1 Serial Windows CITIZEN 1000II Cash Drawer 2 Serial Windows
		USB	CITIZEN 1000II USB Windows CITIZEN 1000II Cash Drawer 1 USB Windows CITIZEN 1000II Cash Drawer 2 USB Windows
CT-S281	Windows	Serial	CITIZEN S281 Serial Windows
		USB	CITIZEN S281 USB Windows
CT-S2000	Windows	Serial	CITIZEN S2000 Serial Windows CITIZEN S2000 Cash Drawer 1 Serial Windows CITIZEN S2000 Cash Drawer 2 Serial Windows
		USB	CITIZEN S2000 USB Windows CITIZEN S2000 Cash Drawer 1 USB Windows CITIZEN S2000 Cash Drawer 2 USB Windows
		Ethernet	CITIZEN S2000 Ethernet Windows CITIZEN S2000 Cash Drawer 1 Ethernet Windows CITIZEN S2000 Cash Drawer 2 Ethernet Windows
CT-S300	Windows	Serial	CITIZEN S300 Serial Windows CITIZEN S300 Cash Drawer 1 Serial Windows CITIZEN S300 Cash Drawer 2 Serial Windows
		USB	CITIZEN S300 USB Windows CITIZEN S300 Cash Drawer 1 USB Windows CITIZEN S300 Cash Drawer 2 USB Windows
		Ethernet	CITIZEN S300 Ethernet Windows CITIZEN S300 Cash Drawer 1 Ethernet Windows CITIZEN S300 Cash Drawer 2 Ethernet Windows
CT-S310	Windows	Serial	CITIZEN S310 Serial Windows CITIZEN S310 Cash Drawer 1 Serial Windows CITIZEN S310 Cash Drawer 2 Serial Windows
		USB	CITIZEN S310 USB Windows CITIZEN S310 Cash Drawer 1 USB Windows CITIZEN S310 Cash Drawer 2 USB Windows
		Ethernet	CITIZEN S310 Ethernet Windows CITIZEN S310 Cash Drawer 1 Ethernet Windows CITIZEN S310 Cash Drawer 2 Ethernet Windows
		Ethernet	CITIZEN S310 Ethernet Windows CITIZEN S310 Cash Drawer 1 Ethernet Linux CITIZEN S310 Cash Drawer 2 Ethernet Linux

Series of Model	OS	Interface	Logical Name
CT-S2000	Windows	Serial	CITIZEN S2000 Serial Windows CITIZEN S2000 Cash Drawer 1 Serial Windows CITIZEN S2000 Cash Drawer 2 Serial Windows
		USB	CITIZEN S2000 USB Windows CITIZEN S2000 Cash Drawer 1 USB Windows CITIZEN S2000 Cash Drawer 2 USB Windows
		Ethernet	CITIZEN S2000 Ethernet Windows CITIZEN S2000 Cash Drawer 1 Ethernet Windows CITIZEN S2000 Cash Drawer 2 Ethernet Windows
CT-S601	Windows	Serial	CITIZEN S601 Serial Windows CITIZEN S601 Cash Drawer 1 Serial Windows CITIZEN S601 Cash Drawer 2 Serial Windows
		USB	CITIZEN S601 USB Windows CITIZEN S601 Cash Drawer 1 USB Windows CITIZEN S601 Cash Drawer 2 USB Windows
		Ethernet	CITIZEN S601 Ethernet Windows CITIZEN S601 Cash Drawer 1 Ethernet Windows CITIZEN S601 Cash Drawer 2 Ethernet Windows
CT-S651	Windows	Serial	CITIZEN S651 Serial Windows CITIZEN S651 Cash Drawer 1 Serial Windows CITIZEN S651 Cash Drawer 2 Serial Windows
		USB	CITIZEN S651 USB Windows CITIZEN S651 Cash Drawer 1 USB Windows CITIZEN S651 Cash Drawer 2 USB Windows
		Ethernet	CITIZEN S651 Ethernet Windows CITIZEN S651 Cash Drawer 1 Ethernet Windows CITIZEN S651 Cash Drawer 2 Ethernet Windows
CT-S801	Windows	Serial	CITIZEN S801 Serial Windows CITIZEN S801 Cash Drawer 1 Serial Windows CITIZEN S801 Cash Drawer 2 Serial Windows
		USB	CITIZEN S801 USB Windows CITIZEN S801 Cash Drawer 1 USB Windows CITIZEN S801 Cash Drawer 2 USB Windows
		Ethernet	CITIZEN S801 Ethernet Windows CITIZEN S801 Cash Drawer 1 Ethernet Windows CITIZEN S801 Cash Drawer 2 Ethernet Windows
CT-S851	Windows	Serial	CITIZEN S851 Serial Windows CITIZEN S851 Cash Drawer 1 Serial Windows CITIZEN S851 Cash Drawer 2 Serial Windows
		USB	CITIZEN S851 USB Windows CITIZEN S851 Cash Drawer 1 USB Windows CITIZEN S851 Cash Drawer 2 USB Windows
		Ethernet	CITIZEN S851 Ethernet Windows CITIZEN S851 Cash Drawer 1 Ethernet Windows CITIZEN S851 Cash Drawer 2 Ethernet Windows
CT-S4000	Windows	Serial	CITIZEN S4000 Serial Windows CITIZEN S4000 Cash Drawer 1 Serial Windows CITIZEN S4000 Cash Drawer 2 Serial Windows
		USB	CITIZEN S4000 USB Windows CITIZEN S4000 Cash Drawer 1 USB Windows CITIZEN S4000 Cash Drawer 2 USB Windows
		Ethernet	CITIZEN S4000 Ethernet Windows CITIZEN S4000 Cash Drawer 1 Ethernet Windows CITIZEN S4000 Cash Drawer 2 Ethernet Windows

2.2.2 Applicable driver (Linux)

Series of Model	OS	Interface	Logical Name
CBM-1000II	Linux	Serial	CITIZEN 1000II Serial Linux CITIZEN 1000II Cash Drawer 1 Serial Linux CITIZEN 1000II Cash Drawer 2 Serial Linux
CT-S281	Linux	Serial	CITIZEN S281 Serial Linux
		USB	CITIZEN S281 USB Linux
CT-S2000	Linux	Serial	CITIZEN S2000 Serial Linux CITIZEN S2000 Cash Drawer 1 Serial Linux CITIZEN S2000 Cash Drawer 2 Serial Linux
		USB	CITIZEN S2000 USB Linux CITIZEN S2000 Cash Drawer 1 USB Linux CITIZEN S2000 Cash Drawer 2 USB Linux
		Ethernet	CITIZEN S2000 Ethernet Windows CITIZEN S2000 Cash Drawer 1 Ethernet Linux CITIZEN S2000 Cash Drawer 2 Ethernet Linux
CT-S300	Linux	Serial	CITIZEN S300 Serial Linux CITIZEN S300 Cash Drawer 1 Serial Linux CITIZEN S300 Cash Drawer 2 Serial Linux
		Ethernet	CITIZEN S300 Ethernet Windows CITIZEN S300 Cash Drawer 1 Ethernet Linux CITIZEN S300 Cash Drawer 2 Ethernet Linux
CT-S310	Linux	Serial	CITIZEN S310 Serial Linux CITIZEN S310 Cash Drawer 1 Serial Linux CITIZEN S310 Cash Drawer 2 Serial Linux
		USB	CITIZEN S310 USB Linux CITIZEN S310 Cash Drawer 1 USB Linux CITIZEN S310 Cash Drawer 2 USB Linux
		Ethernet	CITIZEN S310 Ethernet Windows CITIZEN S310 Cash Drawer 1 Ethernet Linux CITIZEN S310 Cash Drawer 2 Ethernet Linux
CT-S2000	Linux	Serial	CITIZEN S2000 Serial Linux CITIZEN S2000 Cash Drawer 1 Serial Linux CITIZEN S2000 Cash Drawer 2 Serial Linux
		USB	CITIZEN S2000 USB Linux CITIZEN S2000 Cash Drawer 1 USB Linux CITIZEN S2000 Cash Drawer 2 USB Linux
		Ethernet	CITIZEN S2000 Ethernet Windows CITIZEN S2000 Cash Drawer 1 Ethernet Linux CITIZEN S2000 Cash Drawer 2 Ethernet Linux
CT-S601	Linux	Serial	CITIZEN S601 Serial Linux CITIZEN S601 Cash Drawer 1 Serial Linux CITIZEN S601 Cash Drawer 2 Serial Linux
		USB	CITIZEN S601 USB Linux CITIZEN S601 Cash Drawer 1 USB Linux CITIZEN S601 Cash Drawer 2 USB Linux
		Ethernet	CITIZEN S601 Ethernet Windows CITIZEN S601 Cash Drawer 1 Ethernet Linux CITIZEN S601 Cash Drawer 2 Ethernet Linux
CT-S651	Linux	Serial	CITIZEN S651 Serial Linux CITIZEN S651 Cash Drawer 1 Serial Linux CITIZEN S651 Cash Drawer 2 Serial Linux
		USB	CITIZEN S651 USB Linux CITIZEN S651 Cash Drawer 1 USB Linux CITIZEN S651 Cash Drawer 2 USB Linux
		Ethernet	CITIZEN S651 Ethernet Windows CITIZEN S651 Cash Drawer 1 Ethernet Linux CITIZEN S651 Cash Drawer 2 Ethernet Linux

Series of Model	OS	Interface	Logical Name
CT-S801	Linux	Serial	CITIZEN S801 Serial Linux CITIZEN S801 Cash Drawer 1 Serial Linux CITIZEN S801 Cash Drawer 2 Serial Linux
		USB	CITIZEN S801 USB Linux CITIZEN S801 Cash Drawer 1 USB Linux CITIZEN S801 Cash Drawer 2 USB Linux
		Ethernet	CITIZEN S801 Ethernet Windows CITIZEN S801 Cash Drawer 1 Ethernet Linux CITIZEN S801 Cash Drawer 2 Ethernet Linux
CT-S851	Linux	Serial	CITIZEN S851 Serial Linux CITIZEN S851 Cash Drawer 1 Serial Linux CITIZEN S851 Cash Drawer 2 Serial Linux
		USB	CITIZEN S851 USB Linux CITIZEN S851 Cash Drawer 1 USB Linux CITIZEN S851 Cash Drawer 2 USB Linux
		Ethernet	CITIZEN S851 Ethernet Windows CITIZEN S851 Cash Drawer 1 Ethernet Linux CITIZEN S851 Cash Drawer 2 Ethernet Linux
CT-S4000	Linux	Serial	CITIZEN S4000 Serial Linux CITIZEN S4000 Cash Drawer 1 Serial Linux CITIZEN S4000 Cash Drawer 2 Serial Linux
		USB	CITIZEN S4000 USB Linux CITIZEN S4000 Cash Drawer 1 USB Linux CITIZEN S4000 Cash Drawer 2 USB Linux
		Ethernet	CITIZEN S4000 Ethernet Windows CITIZEN S4000 Cash Drawer 1 Ethernet Linux CITIZEN S4000 Cash Drawer 2 Ethernet Linux

3. JavaPOS Driver Setting

3.1. Cinfigration Operation

In order for Control Object to be connected to Service Object exactly and initialize the corresponding device, the JavaPOS control requires data for the jpos.xml file.　The setting data is described as a set of the properties in JposEntry, and it is stored in a key, the pair of the value.

The following is a jpos.xml taking CT-S801 (printer and cash drawer) as an example.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE JposEntries PUBLIC "-//JavaPOS//DTD//EN"
                          "jpos/res/jcl.dtd">
<JposEntries>

    <JposEntry logicalName="CITIZEN S801 USB Windows">
        <creation factoryClass="jpos.loader.simple.SimpleJPOSServiceInstanceFactory"
            serviceClass="jpos.services.Citizen801PrinterServices"/>
        <vendor name="CITIZEN" url="http://www.citizen-systems.co.jp"/>
        <jpos category="POSPrinter" version="1.11"/>
        <product description="Jpos printer driver" name="CITIZEN CT-S801 POS printer"
            url="http://www.citizen-systems.co.jp"/>

        <prop name="PhysicalDevice" type="String" value="CITIZEN CT-S801 POS Printer"/>
        <prop name="PortName" type="String" value="USB001"/>
        <prop name="PrinterLanguage" type="String" value="8"/>
        <prop name="Columns" type="String" value="48"/>
        <prop name="CharacterSet" type="String" value="932"/>
        <prop name="UseNVRAM" type="String" value="0"/>
        <prop name="PaperModel" type="String" value="80mm"/>
        <prop name="deviceBus" type="String" value="USB"/>
    </JposEntry>

    <JposEntry logicalName="CITIZEN S801 Cash Drawer 1 USB Windows">
        <creation factoryClass="jpos.loader.simple.SimpleJPOSServiceInstanceFactory"
            serviceClass="jpos.services.CashDrawerService1"/>
        <vendor name="CITIZEN" url="http://www.citizen-systems.co.jp"/>
        <jpos category="CashDrawer" version="1.11"/>
        <product description="Jpos Cash Drawer Driver" name="CITIZEN CT-S801 Cash Drawer"
            url="http://www.citizen-systems.co.jp"/>

        <prop name="PhysicalDevice" type="String" value="CITIZEN CT-S801 Cash Drawer"/>
        <prop name="deviceBus" type="String" value="USB"/>
        <prop name="PortName" type="String" value="USB001"/>
        <prop name="OnTime" type="String" value="5"/>
        <prop name="Pin3" type="String" value="1"/>
        <prop name="CapStatus" type="String" value="1"/>
    </JposEntry>

</JposEntries>
```

It is registered with an attached jpos.xml file according to a model, the OS, a connection method. Whether you revise it in text editor or please revise it with the setting tool (JCL) of the installation folder.

3.2. JavaPOS Driver Setting Tool (JCL)

1) Please execute the following files in the installation folder. The following screen is displayed.
   Windows   :   JPOSConfig.bat
   Linux   :   JPOSConfig.sh

Setting Tool Main Screen
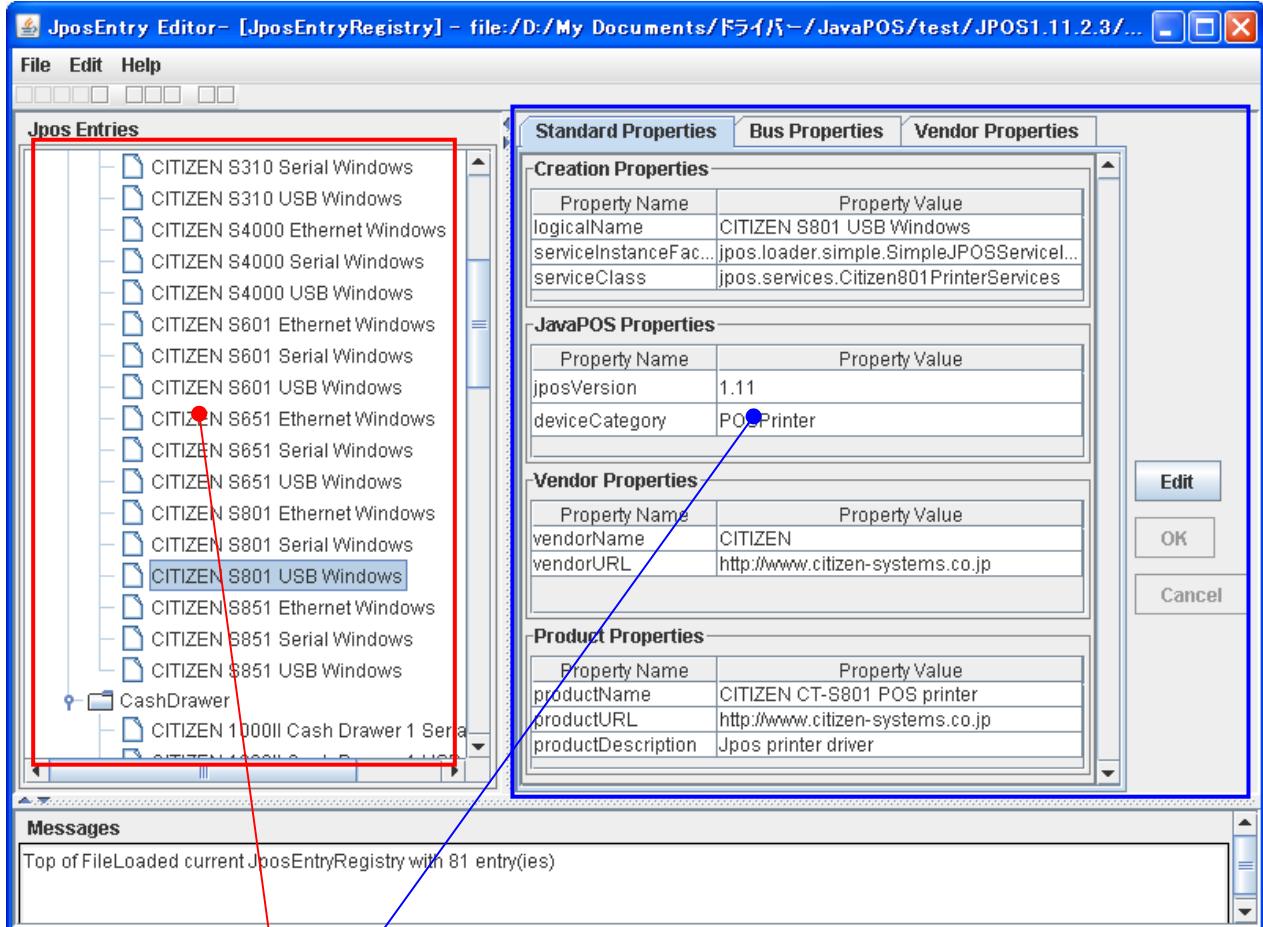
Setting view: Indicates the setting of each device (Direct change of setting is available).
Device view: Tree of physical devices and logical devices is indicated.

2) Select a logical device from the Device view. Please select a "Bus Properties" or "Vendor Properties" tab of the setting view.
3) Click "Edit" button, and the revision of the value is enabled.
4) Click "OK" button after having revised a value.
5) Click "Save JposEntryRegistry" from the File menu for registration.

3.3. Connection setting

3.3.1 Serial connection (Windows)

```
<prop name="portName" type="String" value="COM1"/>            --- Set port name
<prop name="parity" type="String" value="None"/>              --- Set parity
<prop name="flowControl" type="String" value="Hardware"/>     --- Set flow control (Hardware, Xon/Xoff)
<prop name="stopBits" type="String" value="1"/>               --- Set stop bits
<prop name="baudRate" type="String" value="19200"/>           --- Set baud rate
```

Setting Tool Screen

3.3.2 Serial connection (Linux)

```
<prop name="portName" type="String" value="/dev/ttyS0"/>      --- Set port name
<prop name="parity" type="String" value="None"/>              --- Set parity
<prop name="flowControl" type="String" value="Hardware"/>     --- Set flow control (Hardware, Xon/Xoff)
<prop name="stopBits" type="String" value="1"/>               --- Set stop bits
<prop name="baudRate" type="String" value="19200"/>           --- Set baud rate
```

Setting Tool Screen

3.3.3 USB connection (Windows)

<prop name="PortName" type="String" value="USB001"/>   --- Set port name

Setting Tool Screen
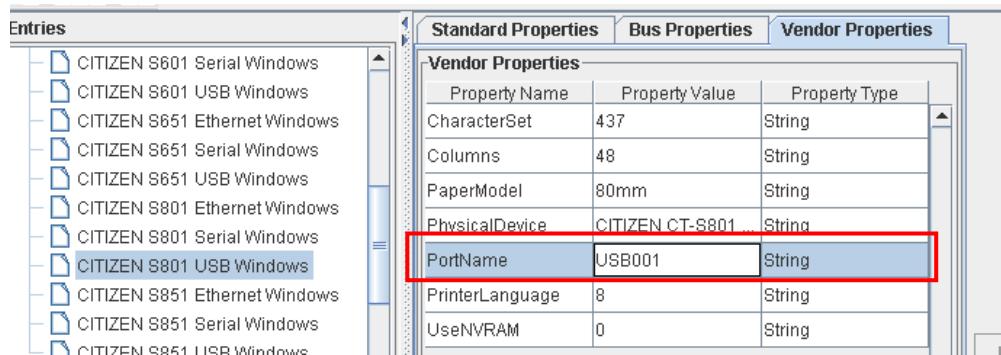
3.3.4 USB connection (Linux)

<prop name="PortName" type="String" value="/dev/usb/lp0"/>   --- Set port name

Setting Tool Screen
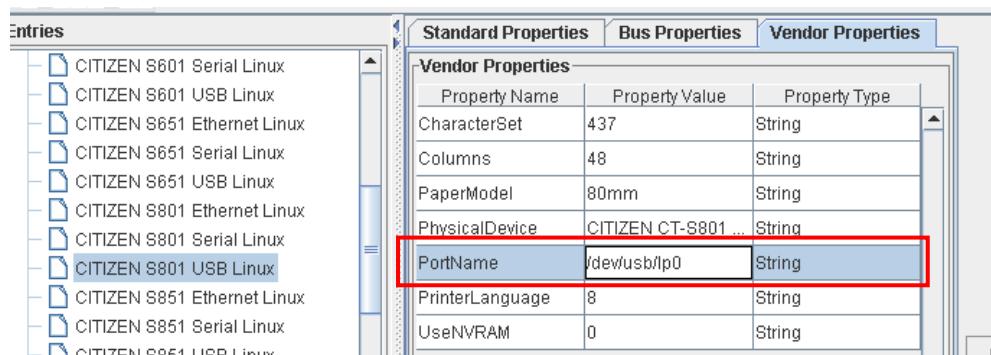
3.3.5 Network connection (Windows, Linux)

<prop name="PortName" type="String" value="IP_192.168.82.21"/>   --- Set port name
<prop name="IPAddress" type="String" value="192.168.82.21"/>   --- Set IP address
<prop name="PortNumber" type="String" value="9100"/>   --- Set port number

Setting Tool Screen
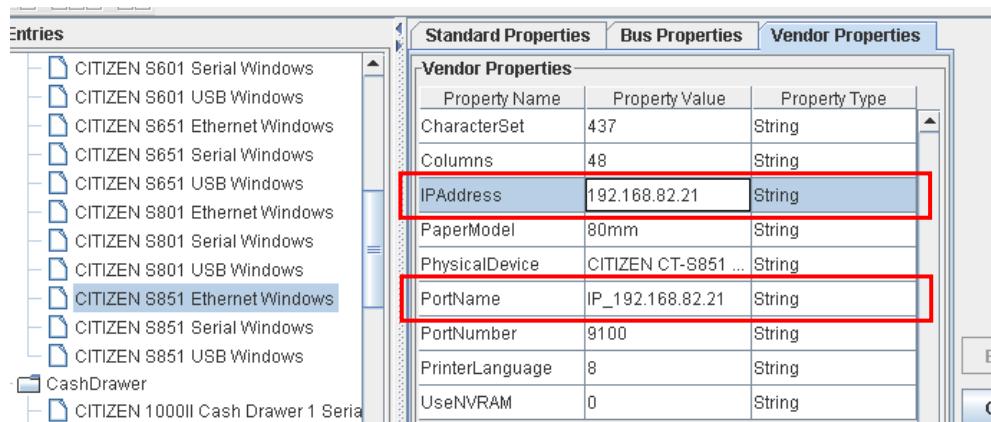
3.4. Printer function setting

For the details, refer to the chapter of "4.POS Printer Service Object".

3.4.1 Size of Paper width used and the maximum number of columns per line

This setting is interlocked with the default value of the "RecLineChars/RecLineCharsList" property.

```
<prop name="Columns" type="String" value="48"/>        --- Set maximum columns
<prop name="PaperModel" type="String" value="80mm"/>   --- Set paper width
```

Setting Tool Screen
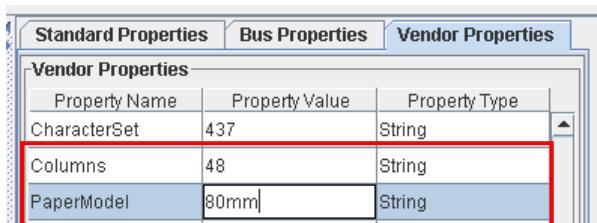
Specify the size of paper width used (PaperModel) and the maximum number of columns per line (Columns) referring to the following table.

CBM-1000TypeII Series

Paper Model		columns	RecLineWidth	RecLineChars	RecLineCharsList
80mm	58mm	30	360	30	30, 40
		36	432	36	36, 48
		42	512	42	42, 56
		48	576	48	48, 64

CT-S281 Series

Paper Model	columns	RecLineWidth	RecLineChars	RecLineCharsList
58mm	32	384	32	32, 42, 48

CT-S300/ 310 Series

Paper Model		columns	RecLineWidth	RecLineChars	RecLineCharsList
80mm	58mm	30	360	30	30, 40, 45
		32	384	32	32, 42, 48
		42	512	42	42, 56, 63
		48	576	48	48, 64, 72

CT-S2000 Series

Paper Model				columns	RecLineWidth	RecLineChars	RecLineCharsList
83mm	80mm	60mm	58mm	30	360	30	30, 40, 45
				32	384	32	32, 42, 48
				36	436	36	36, 48, 54
				42	512	42	42, 56, 64
				48	576	48	48, 64, 72
				53	640	53	53, 71, 80

CT-S601/651/801/851 Series

Paper Model			columns	RecLineWidth	RecLineChars	RecLineCharsList
83mm	80mm	60mm / 58mm	30	360	30	30, 40, 45
			32	384	32	32, 42, 48
			36	436	36	36, 48, 54
			42	512	42	42, 56, 64
			48	576	48	48, 64, 72
			53	640	53	53, 71, 80

CT-S4000 Series

Paper Model			columns	RecLineWidth	RecLineChars	RecLineCharsList
112mm	82.5mm	80mm	42	512	42	42, 56 ,64
			48	576	48	48, 64, 72
			55	660	55	55, 73, 82
			60	720	60	60, 80, 90
			69	832	69	69, 92, 104

3.4.2 Other printer setting

```
<prop name="PrinterLanguage" type="String" value="8"/>      --- Set printer language
<prop name="CharacterSet" type="String" value="437"/>       --- Set character set
<prop name="UseNVRAM" type="String" value="0"/>             --- Set Setbitmap mode
```

Setting Tool Screen

Property Name	Property Value	Property Type
CharacterSet	437	String
Columns	48	String
PaperModel	80mm	String
PhysicalDevice	CITIZEN CT-S801 ...	String
PrinterLanguage	8	String
UseNVRAM	0	String
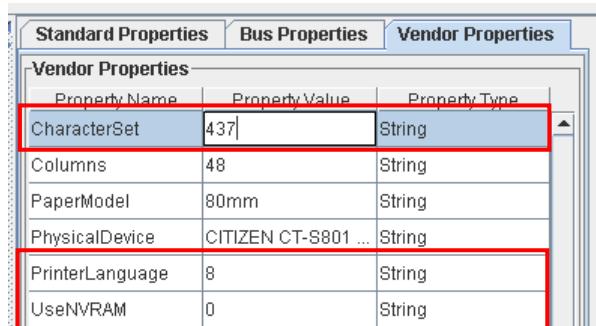
Settings of each item are as shown below.

International Char (PrinterLanguage)

Specify an international character table to use.

Set value: U.S.A(0)/ France(1)/ Germany(2)/ U.K.(3)/ DenmarkI(4)/ Sweden(5)/
Itary(6)/ SpainI(7)/ Japan(8)/ Norway(9)/ Denmark II(10)/ Spain II(11)/
Latin America(12)/ Korea(13)

Code Page (CharacterSet)

Designate code page (Selection content differs by the model)

Set value: 437/ 850/ 852/ 857/ 858/ 860/ 863/ 864/ 865/ 866/ 874/ 932/ 998/ 999/ 1252/
User Defined/

SetBitmap Mode (UseNVRAM)

Specify the bit image mode of the SetBitmap method.

Set value: NV bit image(1) / Raster bit image(0)

3.5. Cash Drawer function setting

3.5.1 Cash Drawer Connection setting

Please set connection setting same as printer which Cash Drawer is connected to.
Please refer to "3.3.Connection setting" for printer connection setting.

3.5.2 Other Cash Drawer setting

```
<prop name="OnTime" type="String" value="5"/>          --- Set signal length
<prop name="Pin3" type="String" value="1"/>            --- Pin3 status of Drawer opened
<prop name="CapStatus" type="String" value="1"/>       --- Set Pin3 connected
```

Setting Tool Screen

Standard Properties	Bus Properties	Vendor Properties	
Vendor Properties			
Property Name	Property Value	Property Type	
CapStatus	1	String	
OnTime	5	String	
PhysicalDevice	CITIZEN CT-S801 ...	String	
Pin3	1	String	
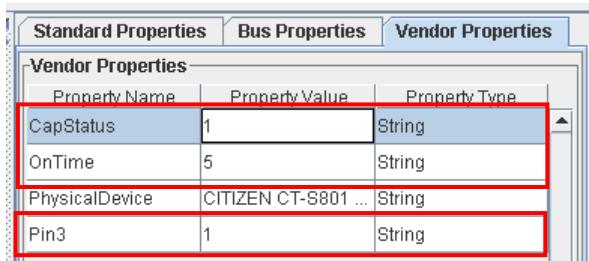
Settings of each item are as shown below.

Signal Length (OnTime)
Specify the time width of the pulse signal output to the solenoid of the cash drawer.
Setting range: 1 to 10msec

Pin3 Connected (CapStatus)
Specify the connection of the the pin 3 (drawer switch input) of the drawer kick connector.
Setting range: Connect(1)/Not connect(0)

Pin3 Status of Drawer Opened (Pin3)
Specify the drawer switch input signal level with cash drawer open.
Setting value: High(1)/Low(0)

4. POS Printer Service Object

For the details, method of use, etc. of property, method and event, refer to "Java for Retail POS Programming Guide".

4.1. POS Printer Property Relations

Property	Attribute		Supporting status	Notes
AutoDisable	R/W	×		
CapCompareFirmwareVersion	R	×		
CapPowerReporting	R	○	JPOS_PR_STANDARD	
CapStatisticsReporting	R	○	true	
CapUpdateFirmware	R	×		
CapUpdateStatistics	R	×		
CheckHealthText	R	○		
Claimed	R	○		
DataCount	R	×		
DataEventEnabled	R/W	×		
DeviceEnabled	R/W	○		
FreezeEvents	R/W	○		
OutputID	R	○	Increment (+1)	Refer to 4.5.7 OutPutID Property/ OutputCompleteEvent Event
PowerNotify	R/W	○		
PowerState	R	○		
State	R	○		
DeviceControlDescription	R	○	JavaPOS POSPrinter Device Control	
DeviceControlVersion	R	○	1011000	
DeviceServiceDescription	R	○	CITIZEN Service Object for Thermal Printers ver 1.11.*.*	
DeviceServiceVersion	R	○	1011***	
PhysicalDeviceDescription	R	○	Citizen Thermal POSPrinter	
PhysicalDeviceName	R	○	CITIZEN ****** POS Printer	Model dependence
CapCharacterSet	R	○	PTR_CCS_ASCII	
CapConcurrentJrnRec	R	×		
CapConcurrentJrnSlp	R	×		
CapConcurrentPageMode	R	×		
CapConcurrentRecSlp	R	×		
CapCoverSensor	R	○		
CapTransaction	R	○		
CapJrnPresent	R	×		
CapJrn2Color	R	×		
CapJrnBold	R	×		
CapJrnDhigh	R	×		
CapJrnDwide	R	×		
CapJrnDwideDhigh	R	×		
CapJrnEmptySensor	R	×		
CapJrnItalic	R	×		
CapJrnNearEndSensor	R	×		
CapJrnUnderline	R	×		
CapJrnCartridgeSensor	R	×		
CapJrnColor	R	×		
CapRecPresent	R	○		
CapRec2Color	R	○		Using paper printable in 2 colors
CapRecBarCode	R	○		
CapRecBitmap	R	○		

Property	Attri bute	Supporting status		Notes
CapRecBold	R	○		
CapRecDhigh	R	○		
CapRecDwide	R	○		
CapRecDwideDhigh	R	○		
CapRecEmptySensor	R	○		
CapRecItalic	R	×		
CapRecLeft90	R	○		
CapRecNearEndSensor	R	○		
CapRecPapercut	R	○		
CapRecRight90	R	○		
CapRecRotate180	R	○		
CapRecStamp	R	×		
CapRecUnderline	R	○		
CapRecCartridgeSensor	R	○	PTR_CART_OK	
CapRecColor	R	○	PTR_CUSTOM_COLOR1	
CapRecMarkFeed	R	○	PTR_MF_TO_CUTTER	
CapRecPageMode	R	×		
CapSlpPresent	R	×		
CapSlpFullslip	R	×		
CapSlp2Color	R	×		
CapSlpBarCode	R	×		
CapSlpBitmap	R	×		
CapSlpBold	R	×		
CapSlpDhigh	R	×		
CapSlpDwide	R	×		
CapSlpDwideDhigh	R	×		
CapSlpEmptySensor	R	×		
CapSlpItalic	R	×		
CapSlpLeft90	R	×		
CapSlpNearEndSensor	R	×		
CapSlpRight90	R	×		
CapSlpRotate180	R	×		
CapSlpUnderline	R	×		
CapSlpBothSidesPrint	R	×		
CapSlpCartridgeSensor	R	×		
CapSlpColor	R	×		
CapSlpPageMode	R	×		
AsyncMode	R/W	○	TRUE / FALSE(default)	Refer to 4.5.5 AsyncMode Property
CartridgeNotify	R/W	×	PTR_CN_DISABLED	
CharacterSet	R/W	○		
CharacterSetList	R	○	437:Code437 850:Code850 Multilingual 860:Code860 Portugal 863:Code863 Canada-French 865:Code865 Norway 852:Code852 EasternEurope 858:Code858 864:Code864 Arabic 874:Code874 Tai Code 18 866:Code866 Russia 857:Code857 Turkey 932:KANA 998:ASCII 999:Windosw Code 1252:Windows Code	Model dependence

Property	Attri bute		Supporting status	Notes
CoverOpen	R	○	TRUE: POS printer cover is open. FALSE: POS printer cover is closed.	
ErrorLevel	R	○	PTR_EL_NONE PTR_EL_RECOVERABLE PTR_EL_FATAL	Refer to 4.5.6 ErrorLevel Property
ErrorStation	R	○	PTR_S_RECEIPT	
ErrorString	R	○		Description on present error is retained.
FontTypefaceList	R	○	0,1,2	Model dependence
FlagWhenIdle	R/W	○		
MapMode	R/W	○	PTR_MM_DOTS(default) PTR_MM_TWIPS PTR_MM_ENGLISH PTR_MM_METRIC	
PageModeArea	R	×		
PageModeDescriptor	R	×		
PageModeHorizontalPosition	R/W	×		
PageModePrintArea	R/W	×		
PageModePrintDirection	R/W	×		
PageModeStation	R/W	×		
PageModeVerticalPosition	R/W	×		
RotateSpecial	R/W	○	PTR_RP_NORMAL(default) PTR_RP_RIGHT90 PTR_RP_LEFT90 PTR_RP_ROTATE180	Refer to 4.5.1 printBarCode Method/ rotateSpecial Property
JrnLineChars	R/W	×		
JrnLineCharsList	R	×		
JrnLineHeight	R/W	×		
JrnLineSpacing	R/W	×		
JrnLineWidth	R	×		
JrnLetterQuality	R/W	×		
JrnEmpty	R	×		
JrnNearEnd	R	×		
JrnCartridgeState	R	×	PTR_CART_UNKNOWN	
JrnCurrentCartridge	R/W	×		
RecBarCodeRotationList	R	○	0, R90, L90, 180	
RecBitmapRotationList	R	○	Raster bit image mode: 0,R90,L90,180 NV bit image mode: 0,180	
RecCartridgeState	R	×	TR_CART_UNKNOWN	
RecCurrentCartridge	R/W	○	PTR_CUSTOM_COLOR1	
RecEmpty	R	○		
RecLetterQuality	R/W	×		
RecLineChars	R/W	○		Refer to 4.5.8 RecLineChars/ RecLineCharsList Property
RecLineCharsList	R	○		Refer to 4.5.8 RecLineChars/ RecLineCharsList Property
RecLineHeight	R/W	○		The value is changed according to the RecLineChars property.
RecLineSpacing	R/W	○		Only if the value is smaller than RecLineHeight property, the value is changed in accordance with to the RecLineHeight property.
RecLinesToPaperCut	R	○		The value is changed according to the RecLineChars property.
RecLineWidth	R	○		The value is changed according to the RecLineChars property.
RecNearEnd	R	○		

Property	Attribute		Supporting status	Notes
RecSidewaysMaxLines	R	○		Refer to 4.5.10 RecSidewaysMaxLines Property
RecSidewaysMaxChars	R	○		Refer to 4.5.9 RecSidewaysMaxChars Property
SlpBarCodeRotationList	R	×		
SlpBitmapRotationList	R	×		
SlpCartridgeState	R	×	PTR_CART_UNKNOWN	
SlpCurrentCartridge	R/W	×		
SlpEmpty	R	×		
SlpLetterQuality	R/W	×		
SlpLineChars	R/W	×		
SlpLineCharsList	R	×		
SlpLineHeight	R/W	×		
SlpLinesNearEndToEnd	R	×		
SlpLineSpacing	R/W	×		
SlpLineWidth	R	×		
SlpMaxLines	R	×		
SlpNearEnd	R	×		
SlpPrintSide	R	×	PTR_PS_UNKNOWN	
SlpSidewaysMaxChars	R	×		
SlpSidewaysMaxLines	R	×		

4.2. POS Printer Method Relations

Method	Supporting status		Notes
Open	○		
Close	○		
Claim	○		
Release	○		
checkHealth	○	JPOS_CH_EXTERNAL	Test print is supported.
clearInput	×	This method is not supported.	
clearInputProperties	×	This method is not supported.	
clearOutput	○		Data being transmitted cannot be stopped.
directIO	×		
compareFirmwareVersion	×		
resetStatistics	×		
retrieveStatistics	○		
updateFirmware	×		
updateStatistics	×		
beginInsertion	×		
beginRemoval	×		
changePrintSide	×		
clearPrintArea	×		
cutPaper	○	Partial cut (1-99) Full cut (100)	
endInsertion	×		
endRemoval	×		
markFeed	○		Blackmark paper and label paper are supported.
pageModePrint	×		
printBarCode	○		Refer to 4.5.1 printBarCode Method/ rotateSpecial Property
printBitmap	○	Raster bit image printing	Refer to 4.5.4 printBitmap Method
printImmediate	○		

Method		Supporting status	Notes
printMemoryBitmap	○	BMP format only	
printNormal	○		
printTwoNormal	×		
rotatePrint	○		Refer to 4.5.2 rotatePrint Method
setBitmap	○	Raster bit image mode NV bit image mode	Refer to 4.5.3 setBitmap Method/ ESC|#B Escape Sequence
setLogo	○		
transactionPrint	○		
validateData	○		

4.3. POS Printer Escape Sequence Relations

Escape Sequence			Supporting status	Notes
Paper cut	ESC|#P	○	Partial cut (1-99) Full cut (100)	
Feed and paper cut	ESC|#fP	○	Partial cut (1-99) Full cut (100)	
Feed, cut, and stamp print	ESC|#sP	×		
Bitmap print	ESC|#B	○	1-20 Specifies Bitmap number registered by the SetBItmap method. Printing is carried out in raster bit image or NV bit image mode.	After Bitmap printing, print position returns to the initial state (left-justified). Refer to 4.5.3 setBitmap Method/ ESC|#B Escape Sequence
Top logo print	ESC|tL	○		
Bottom logo print	ESC|bL	○		
Stamp print	ESC|sL	×		
Multi-line feed	ESC|#lF	○		
Unit feed	ESC|#uF	○		
Reverse feed	ESC|#rF	×		
Font type specification	ESC|#fT	○		
Bold	ESC|bC	○		
Underline	ESC|#uC	○		
Italic	ESC|iC	×		
Custom color	ESC|#rC	○		Effective only when dedicated 2-color paper is used.
Red	ESC|rC	○		Effective only when dedicated 2-color paper is used.
Reverse character	ESC|rvC	○		
Shaded character	ESC|#sC	×		
Standard	ESC|1C	○		
Double width	ESC|2C	○		
Double height	ESC|3C	○		
Quadruple	ESC|4C	○		
Horizontal magnification	ESC|#hC	○	1-8	
Vertical magnification	ESC|#vC	○	1-8	
Color specification	ESC|#fC	○		Effective only when dedicated 2-color paper is used.
Centering	ESC|cA	○		
Right adjustment	ESC|rA	○		
Normal	ESC|N	○		
Subscript	ESC|tbC	×		
Superscript	ESC|tpC	×		

4.4. POS Printer Event Relations

Event	Supporting status		Notes
DataEvent	×		
DirectIOEvent	×		
ErrorEvent	○		
OutputCompleteEvent	○	Increment (+1)	Refer to 4.5.7 OutPutID Property/ OutputCompleteEvent Event
StatusUpdateEvent	○		

4.5. POS Printer Precautions

4.5.1 printBarCode Method / RotateSpecial Property

- Supported barcodes

   PTR_BCS_UPCA,   PTR_BCS_UPCE, PTR_BCS_EAN8,   PTR_BCS_JAN8, PTR_BCS_EAN13,
   PTR_BCS_JAN13, PTR_BCS_ITF,   PTR_BCS_CODABAR, PTR_BCS_CODE39,   PTR_BCS_CODE93,
   PTR_BCS_CODE128, PTR_BCS_CODE128_PARSED

- About UPC-E barcode printing

   This printer compresses the 11- or 12-digit data entered to 8-digit data by using the zero
   suppression method of UPC-E standard.   The following is an example of data compression using
   zero suppression method.
   Ex: Set the original code to be "0-ABCDE-VWXYZ" (11 digits).   Printable patterns are as follows:
   1) When all V through Y are"0"

   "0-ABCDE-0000Z": Denotes "ABCDEZ", where Z is any of 5 through 9.
   2) When E and VWXY are all "0"

   "0-ABCD0-0000Z": Denotes "ABCDZ4".   The last 4 indicates that A and D of manufacturer code
   is not "0".
   3) When DE and VWX are "0"

   "0-ABC00-000YZ": Denotes "ABCYZ3".   The last 3 indicates that A and C are not "0" but ABC is
   a number of 3 digits.
   4) When DE and VW are "0" and C is "0", "1", or "2":

   i) When C = "0": "0-AB000-00XYZ" -> "ABXYZ0"
   ii) When C = "1": "0-AB100-00XYZ" -> "ABXYZ1"
   iii) When C = "2": "0-AB200-00XYZ" -> "ABXYZ2"

   The check digit is automatically calculated in the printer.   When a condition other than the above
   is specified and executed, error (JPOS_E_ILLEGAL) is returned because the printer cannot print
   due to its specification requirement.

- About rotating printing of symbol

   Available rotating direction is 0・ and 180・ (all models).

- Regarding Designation Range of Bar-Code height (Height Parameter) and Width (Width parameter)

   The designation range for both parameters when MapMode Property is set to PtrMmDots is as
   follows;

Height Parameter:
   1 - 255
Width Parameter:
   1 - Value of the RecLineWidth Property
   * Narrow element width is printed with 3 dots (printer initial value) fixed for either value setting.

4.5.2 rotatePrint Method

Printing size dynamically changes by printing data within the value of RecSidewaysMaxChars. Rotational printing of printBitmap Method is not supported. Please refer to [4.5.4 printBitmap Method] for printBitmap Method when RotatePrint method (Rotate print) is designated.

4.5.3 setBitmap Method / ESC|#B Escape Sequence

Bitmap is registered by specifying Bitmap number (1 - 20) using the SetBitmap method and bitmap printing is carried out by specifying the registered number in the ESC|#B escape sequence.   This driver has two modes, raster bit image mode and NV bit image mode.   Specification of each mode is as shown below.
- Raster bit image mode
   SO stores own bitmap using the SetBitmap method.   When SO is closed, the stored bitmap is cleared.   Therefore, it is necessary to register bitmap each time SO is opened.
   In this mode, bitmap is memorized including printing position designated at the time of registration.
- NV bit image mode
   By using the setBitmap method, SO writes bitmap to the nonvolatile memory (Flash ROM) of the printer.
   Therefore, it is not necessary to register bitmap each time SO is opened.
   In this mode, the printing position designated at the time of registration is not stored and printing starts from the left end.

The initial value of this driver is raster bit image mode.   To change to the NV bit image mode, perform the configration operation. Please refer to [3.4.2 Other printer setting].

* The time required for write operation in NV bit image mode depends on the communication condition, printer performance, etc.
* To insure long life of the printer, registration of NV bitmap shall be less than 10 times/day.
* The pixel size which can be designated by driver side is shown as above but there is physical limitation of size in transverse direction at printer side. Please refer to Command Reference for the details of printer physical size.

4.5.4 printBitmap Method

Perform bitmap printing with the designation of bitmap file and printing position. This method will not be affected by Bitmap Rotate Print Designation (BitMap Rotate Designation of rotatePrint method).
- **Combination of RotatePrint Method and PrintBitmap**
   Please be careful of printing result differing from program execution order when performing the

combination of rotatePrint Method (Character Rotate Print Designation) and printBitmap Method.

4.5.5 AsyncMode Property

- TRUE

Output method (printNormal, printTwoNormal, cutPaper, rotatePrint, printBarCode, printBitmap) is executed asynchronously.

- FALSE

Output method is printed synchronously.   When error occurs at the asynchronous output, error event is reported at about 0.5-s intervals.

4.5.6ErrorLevel Property

- PTR_EL_NONE

Indicated when error is not detected.

- PTR_EL_RECOVERABLE

Indicated as recoverable error when Paper Out/Cover Open.

- PTR_EL_FATAL

Indicated as irrecoverable error at Auto Cutter error happened.

4.5.7 OutPutID Property/ OutputCompleteEvent Event

Identifier of asynchronous output started just before is retained and OutputID Property is incremented by +1.

4.5.8 RecLineChars/ RecLineCharsList Property

The number of one-byte characters of the font printed in one line on the paper is specified.
- RecLineChars property: Specifies the maximum number of digits of FontA corresponding to the specified paper size.
- RecLineCharsList property: Lists the maximum number of digits of FontA, FontB, FontC corresponding to the specified paper size.   (Some printer has no FontC.)

For details of printer fonts, refer to User's Guide of the printer.

When setting the initial value of paper size and maximum number of digits (FontA), perform the configration operation. Please refer to [3.4.1 Size of Paper width used and the maximum number of columns per line].

The value of the RecLineChars/ RecLineCharsList corresponding to "Paper Model", "columns" and "Printer font" of each printer is as shown below.

CBM-1000TypeII Series

Paper Model		columns	FontA(12*24dot)	FontB(9*24dot)
80mm	58mm	30	30	40
		36	36	48
		42	42	56
		48	48	64

CT-S281 Series

Paper Model	columns	FontA(12*24dot)	FontB(9*24dot)	FontC(8*16dot)
58mm	32	32	42	48

CT-S300/ 310 Series

Paper Model		columns	FontA(12*24dot)	FontB(9*17dot)	FontC(8*16dot)
80mm	58mm	30	30	40	45
		32	32	42	48
		42	42	56	63
		48	48	64	72

CT-S2000 Series

Paper Model				columns	FontA(12*24dot)	FontB(9*24dot)	FontC(8*16dot)
83mm	80mm	60mm	58mm	30	30	40	45
				32	32	42	48
				36	36	48	54
				42	42	56	64
				48	48	64	72
				53	53	71	80

CT-S601/651/801/851 Series

Paper Model				columns	FontA(12*24dot)	FontB(9*17dot)	FontC(8*16dot)
83mm	80mm	60mm	58mm	30	30	40	45
				32	32	42	48
				36	36	48	54
				42	42	56	64
				48	48	64	72
				53	53	71	80

CT-S4000 Series

Paper Model			columns	FontA(12*24dot)	FontB(9*24dot)	FontC(8*16dot)
112mm	82.5mm	80mm	42	42	56	64
			48	48	64	72
			55	55	73	82
			60	60	80	90
			69	69	92	104

- About Kanji font (KANJI)

   As shown above, Kanji font is calculated based on one-byte character.　Accordingly, when Kanji font of multi-font is used, it is treated as two characters basically.

   (Refer to [4.5.9 RecSidewaysMaxChars Property].)

4.5.9 RecSidewaysMaxChars Property

Calculation is made based on one-byte character.

Kanji font (KANJI) is basically treated as two characters but some font selected by the value of the RecLineChars property may not correspond to two characters simply.

4.5.10RecSidewaysMaxLines Property

This varies in conjunction with the value of the RecLineSpacing property and RecLineChars property.
In addition, in some cases, the value may be smaller than the actual number of printable lines depending on the value of the preset RecLineSpacing property.

4.5.11 StatusUpdateEvent Event

The Status parameter of this event is for device class intrinsic data and status change such as paper or lid is indicated at printer. Followings are Status parameter Values against status change of CITIZEN POS printer.

Printer Status	StatusUpdateEvents(Status)
Opened the Lid	PTR_SUE_COVER_OPEN
Paper is taken out	PTR_SUE_REC_NEAREMPTY
Closed the lid without loading paper	PTR_SUE_COVER_OK
	PTR_SUE_REC_EMPTY

In addition, power status change is indicated for the printer which is able to set PowerNotify Property Value indicating the type of power notification function on JPOS_PN_ENABLED.

5. Cash Drawer Service Object

For the details, method of use, etc. of property, method and event, refer to "Java for Retail POS Programming Guide".

5.1. Cash Drawer Property Relations

Property	Attribute		Supporting status	Notes
AutoDisable	R/W	×		
CapCompareFirmwareVersion	R	×		
CapPowerReporting	R	○	JPOS_PR_NONE	Refer to 5.4.1 CapPowerReporting/ PowerNotify/ PowerState Property
CapStatisticsReporting	R	×		
CapUpdateFirmware	R	×		
CapUpdateStatistics	R	×		
CheckHealthText	R	○		
Claimed	R	○		
DataCount	R	×		
DataEventEnabled	R/W	×		
DeviceEnabled	R/W	○		
FreezeEvents	R/W	○		
OpenResult	R	○		
OutputID	R	×		
PowerNotify	R/W	×	JPOS_PN_DISABLE	Refer to 5.4.1 CapPowerReporting/ PowerNotify/ PowerState Property
PowerState	R	×	JPOS_PS_UNKNOWN	Refer to 5.4.1 CapPowerReporting/ PowerNotify/ PowerState Property
State	R	○		
DeviceControlDescription	R	○	JavaPOS CashDrawer Device Control	
DeviceControlVersion	R	○	1011000	
DeviceServiceDescription	R	○	CITIZEN Service Object for Thermal Printer Cash Drawers ver 1.11.*.*	
DeviceServiceVersion	R	○	1011***	
PhysicalDeviceDescription	R	○	CITIZEN Thermal POSPrinter Cash Drawer *	
PhysicalDeviceName	R	○	CITIZEN ****** Cash Drawer	Model dependence
CapStatus	R	○		
CapStatusMultiDrawerDetect	R	○		
DrawerOpened	R	○		

5.2. Cash Drawer Method Relations

Method	Supporting status		Notes
open	○		
close	○		
claim	○		
release	○		
checkHealth	○	JPOS_CH_EXTERNAL	
clearInput	×		
clearOutput	×		
directIO	×		
resetStatistics	×		
retrieveStatistics	×		
updateStatistics	×		

Method	Supporting status	Notes
openDrawer	○	
waitForDrawerClose	○	

5.3. Cash Drawer Event Relations

Event	Supporting status	Notes
DataEvent	×	
DirectIOEvent	×	
ErrorEvent	×	
OutputCompleteEvent	×	
StatusUpdateEvent	○	

5.4. Cash Drawer Precautions

5.4.1 CapPowerReporting/ PowerNotify/ PowerState Property

This service object supports only cash drawer connected to the drawer kick connector at the back of the printer.   Therefore the value of the CapPowerReporting property shall be "JPOS_PR_NONE". (The power state can not be acquired with the PowerState property.)

5.4.2 CapStatusMultiDrawerDetect Property

Two cash drawers can be connected by using Y-Shape cable to drawer kick connector at this service object but individual detection of cash drawer open/close situation is not possible. For this reason, CapStatusMultiDrawerDetect Property value becomes "FALSE" .

When CapStatusMultiDrawerDetect Property is "FALSE", only the following status is informed.
  a) All cash drawers are closed.
  b) One or more cash drawer(s) is open.
In addition, each [Pin 3 Status of Drawer Opened (Pin3)] should be set in the same way when registering multiple numbers of cash drawers.

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