

EPSON OPOS ADK MANUAL

APPLICATION DEVELOPMENT GUIDE

POSPrinter (TM-L100)

Version 3.00 Jan. 2022

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Section 1. Introduction

This manual describes the method of use and related items, as well as machine-specific precautions, when the EPSON TM-L100 Series POS Printers are used with the EPSON OPOS ADK program.

This manual applies to the following devices.

Device List

Serial	USB	Ethernet	Bluetooth
TM-L100	TM-L100U	TM-L100E	TM-L100B

Before reading the manual, see the following explanation about the characteristic of the TM-L100 models.

- Station: Receipt (Line Thermal 203 dpi X 203 dpi)

Throughout the manual, the various model names will be referred to as TM-L100.

Compatibility mode

The compatibility mode for upward compatibility was added in OPOS Ver2.60.

For the details of the compatibility mode, please refer to “EPSON OPOS ADK MANUAL APPLICATION DEVELOPMENT GUIDE Compatibility Mode”.

Section 2. Details on Settings

This section describes connection configurations and how to make the settings for the TM-L100 printers.

2.1 References of Firmware Versions

Refer to the release notes (Relnote.txt).

2.2 Setting of DIP Switches

Not applicable.

2.3 Port Information

1) Port information when serial port is used

The port information that can be set with the SetupPOS utility is as follows.

Item	Setting range
Baud rate [bps]	2400,4800,9600,19200,38400 ,57600 ,115200
Bit length [bit]	8
Parity	NONE, ODD, EVEN
Stop bit [bit]	1
Handshake	DTR/DSR

*1 These Baud rate require setting via Memory Switch.

The default settings are as shown in the following table.

Item	Setting range
Baud rate [bps]	115200
Bit length [bit]	8
Parity	NONE
Stop bit [bit]	1
Handshake	DTR/DSR

The baud rate setting of devices is set using the TM-L100 Utility. For details, please refer to the "TM-L100 Utility User's Manual".

2) Port information when using USB port

Not applicable

3) Port information when using Ethernet port

Not applicable

4) Port information when using Bluetooth port

Not applicable

2.4 Device Settings

The following explanation is about the settings for TM-L100.

2.4.1 Usable Device Specific Settings

For the TM-L100, the following device specific settings are settable by the SetupPOS utility. For the detail, please refer to the Section 2 of “EPSON OPOS ADK MANUAL APPLICATION DEVELOPMENT GUIDE POSPrinter (TM Series)”.

Tab	Settings
General	Disable panel buttons
	Assume print complete when data output finishes
	Homogenize Error Codes
	Ignore firmware version check
	Output complete timeout
Paper	Paper Type
	Paper Width [mm]: LineWidth [dot]: LineCharsList
Bitmap	TMFlogo...
	NVRAM
Color Bitmap	Halftone: Method
	Halftone: Brightness
	Color: Primary
Status Log	ERROR
	OFFLINE
	Log file name (include full path)
	Maximum file size [KB]
Printing Properties	Receipt Characters per Line
	Receipt Line Spacing [dots]
	CharacterSet [CodePage Number]

Section 3. Function Details

This section describes the functions of the TM-L100 printers in details. Supplementary explanation of the parts not described in detail in the "UPOS" is also given here.

3.1 Property Set Values and Default Values

The following explanation is about the property set values and the default values.

3.1.1 Capability Set Values

The following values are the Capability set values.

Capability Name	Set Value
CapTransaction	TRUE
CapCoverSensor	TRUE
CapConcurrentRecSlp	FALSE
CapConcurrentJrnSlp	FALSE
CapConcurrentJrnRec	FALSE
CapConcurrentPageMode	FALSE
CapCharacterSet	PTR_CCS_UNICODE
CapMapCharacterSet	TRUE
CapJrnUnderline	FALSE
CapJrnNearEndSensor	FALSE
CapJrnItalic	FALSE
CapJrnEmptySensor	FALSE
CapJrnDwideDhigh	FALSE
CapJrnDwide	FALSE
CapJrnDhigh	FALSE
CapJrnColor	0
CapJrnCartridgeSensor	0
CapJrnBold	FALSE
CapJrn2Color	FALSE
CapJrnPresent	FALSE
CapRecPageMode	TRUE
CapRecUnderline	TRUE
CapRecStamp	FALSE
CapRecRotate180	TRUE
CapRecRight90	TRUE
CapRecPapercut	TRUE
CapRecNearEndSensor	FALSE
CapRecMarkFeed	0 or PTR_MF_TO_CUTTER *1
CapRecLeft90	TRUE
CapRecItalic	FALSE

CapRecEmptySensor	TRUE
CapRecDwideDhigh	TRUE
CapRecDwide	TRUE
CapRecDhigh	TRUE
CapRecColor	PTR_COLOR_PRIMARY
CapRecCartridgeSensor	0
CapRecBold	TRUE
CapRecBitmap	TRUE
CapRecBarCode	TRUE
CapRec2Color	FALSE
CapRecPresent	TRUE
CapRecRuledLine	FALSE
CapSlpUnderline	FALSE
CapSlpRotate180	FALSE
CapSlpRight90	FALSE
CapSlpNearEndSensor	FALSE
CapSlpLeft90	FALSE
CapSlpItalic	FALSE
CapSlpEmptySensor	FALSE
CapSlpDwideDhigh	FALSE
CapSlpDwide	FALSE
CapSlpDhigh	FALSE
CapSlpColor	0
CapSlpCartridgeSensor	0
CapSlpBothSidesPrint	FALSE
CapSlpBold	FALSE
CapSlpBitmap	FALSE
CapSlpBarCode	FALSE
CapSlp2Color	FALSE
CapSlpFullslip	FALSE
CapSlpPresent	FALSE
CapSlpPageMode	FALSE
CapSlpRuledLine	FALSE

*1 This value changes depending on the "Paper Layout" setting that can be set with the "TM-L100 Utility".

For details on "Paper Layout" settings, refer to the "TM-L100 Utility" manual.

3.1.2 List Properties

The List Properties are explained in the following.

List Property	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"
JrnLineCharsList	""
RecLineCharsList	80mm 48column mode : 48, 64 80mm 42column mode : 44, 55 58mm : 35, 46 40mm : 23, 31
SlpLineCharsList	""
RecBarCodeRotationList	"0,R90, L90, 180"
RecBitmapRotationList	"0,R90, L90, 180"
SlpBarCodeRotationList	""
SlpBitmapRotationList	""
FontTypefaceList	""

3.1.3 Width and Height Properties

The width and height properties are explained in the following.

Property	Settings		
	Default Value	Maximum value [dot]	Minimum value [dot]
RecLineSpacing	30 ^{*4}	127 ^{*5}	24 ^{*1}
JrnLineSpacing	X	X	X
SlpLineSpacing	X	X	X
SlpLineHeight [dot]	X		
RecLineHeight ^{*6} [dot]	24,17		
JrnLineHeight [dot]	X		
SlpLineWidth [dot]	X		
RecLineWidth [dot]	80mm 48column mode : 576 80mm 42column mode : 552 58mm : 420 40mm : 280		
JrnLineWidth [dot]	X		
RecSidewaysMaxLines ^{*3}	RecLineWidth/RecLineSpacing		
RecSidewaysMaxChars	80mm 42column mode : FontA : 184 FontB : 240 Other paper width : FontA : 200 FontB : 266		
RecLinesToPaperCut	6 ^{*2}		
SlpSidewaysMaxLines	X		
SlpSidewaysMaxChars	X		
SlpMaxLines	X		

X: No settings

^{*1} In the case of a line thermal station, the Line Spacing setting is identical with the height of the characters which means that it can be set at up to 17 when Font B is selected.

^{*2} It can be changed by the settings of the RecLineSpacing or the character height.

^{*3} It can be changed by the settings of the RecLineSpacing or the RecLineHeight.
The value differs accordance with the selected paper width.

3.1.4 Common Property Strings

The Device information properties are described below.

I/F	Device Name	Device Description
S	TM-L100	EPSON TM-L100 POS Printer
U	TM-L100U	EPSON TM-L100U POS Printer
E	TM-L100E	EPSON TM-L100E POS Printer
B	TM-L100B	EPSON TM-L100B POS Printer

I/F indicate the connected interface.

The following is the list of the four connecting interfaces.

S: Serial

U: USB

E: Ethernet

B: Bluetooth

3.1.5 PageMode Print Properties

The Device information properties are described below.

Property	Station *2		
	Journal	Receipt	Slip
PageModeArea		80mm 48column mode : "576, 2400" 80mm 42column mode : "552, 2400" 58mm : "420, 2400" 40mm : "280, 2400"	
PageModeDescriptor *1	-	BM/BC/BMR/BCR	-

*1 Following setting values are used for the PageModeDescriptor property.

BM : Bitmap printing is available.

BC : Barcode printing is available.

BMR : Rotated printing of bitmap is available.

BCR : Rotated printing of barcode is available.

3.2 Methods

The following explanation is about supported/unsupported Methods, and the detailed information.

Method	Supported/Unsupported	Compatibility with the PageMode printing
PrintNormal	O	O
PrintTwoNormal	X	X
PrintImmediate	O	O ^{*1}
PrintBarCode	O	O ^{*2}
PrintBitmap	O	O ^{*3}
PrintMemoryBitmap	O	O ^{*3}
CutPaper	O (1~100: Cutting with one point of the bottom left corner uncut)	X
MarkFeed	X ^{*4}	X
ChangePrintSide	X	X
ValidateData	O	O
TransactionPrint	O	O
SetLogo	O	O
SetBitmap	O	O
RotatePrint	O	X
EndRemoval	X	X
BeginRemoval	X	X
EndInsertion	X	X
BeginInsertion	X	X
ClearPrintArea	O	O
PageModePrint	O	O
DrawRuledLine	X	X

O: Supported

X : Unsupported

^{*1} If the specified Station is ready to print, the printing data shall not be stored in the PageMode printing buffer but, instead, go straight to printing. If the Station is not ready to print, an error is returned.

^{*2} If other than "LEFT" is specified for the printing position of barcode, the printing shall be done, regardless of the PageModeHorizontalPosition property setting, based on the PageModePrintArea property setting in the horizontal direction.

^{*3} If other than "LEFT" is specified for the printing position of bitmap, the printing shall be done, regardless of the PageModeHorizontalPosition property setting, based on the PageModePrintArea property setting in the horizontal direction.

^{*4} This value changes depending on the "Paper Layout" setting that can be set with the "TM-L100 Utility".

For details on "Paper Layout" settings, refer to the "TM-L100 Utility" manual.

3.3 Escape Sequences

The following figure is about supported/unsupported Escape Sequences.

Escape Sequence	Supported/Unsupported	Compatibility with the PageMode printing
#P	0~100	X
#fP	0~100	X
#sP	X	X
sL	X	X
#B	O	O
tL	O	O
bL	O	O
[*]#R	O	O
#IF	0~9999	O
#uF Base Pitch [inch]	0~ equiv. 50 cm	O
#rF Maximum [inch]	X	X
[*]#E	0~65535	X
#fT	X	X
[!] b C	O	O
[!] [#] uC	1~2	1~2
[!] i C	X	X
#rC	1	O
[!] rv C	O	O
#sC	X	X
#fC	X	X
[!] tb C	X	X
[!] tp C	X	X
1C	O	O
2C	O	O
3C	O	O
4C	O	O
#hC	1~8	O
#vC	1~8	O
cA	O	O ^{*1}
rA	O	O ^{*1}
lA	O	O
[!] [#] stC	X	X
*#dL	X	X
N	O	O

O: Supported

X : Unsupported

Numbers: Settable range

^{*1} Regardless of the PageModeHorizontalPosition property setting, center or right adjust what is to be printed based on the PageModePrintArea property setting in the horizontal direction.

3.4 Printable Barcode Type

The TM-L100 models allow the following barcode types.

- Code 128
- Code 128 Parsed
- Code 93
- Codabar
- ITF
- Code 39
- JAN 13 (EAN 13)
- JAN 8 (EAN 8)
- UPC-E
- UPC-A
- PDF417
- QRCODE
- MAXI CODE
- GS1-Data
- GS1-Data Expanded
- GS1-128
- GS1-Data Truncated
- GS1-Data Limited
- GS1-Data Stacked
- GS1-Data Stacked Omnidirectional
- GS1-Data Expanded Stacked
- Composite
- AztecCode
- DataMatrixCode

3.5 Code128/ Code128 Parsed Printing

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.

Data (example)	Size optimization	Width check
1234567890	O	X
{C1234567890	X	O

O: Applicable

X : Not applicable

3.6 MAXI CODE Printing

When printing MAXI CODE, set the Symbology parameter to one of the following values.

PTR_BCS_MAXICODE : Print using MAXI mode 2.

PTR_BCS_OTHER + 0 : Print using MAXI mode 3.

PTR_BCS_OTHER + 1 : Print using MAXI mode 4 or 5. The mode is set to 4 or 5 automatically depending on the length of the Data parameter. (If the data is long, then the data correction level is lowered for printing.)

PTR_BCS_OTHER + 2 : Print using MAXI mode 6.

3.7 QR CODE Printing

When printing QR CODE, set the Symbology parameter to one of the following values.

PTR_BCS_QRCODE : Print using QR CODE model 2.

PTR_BCS_OTHER + 3 : Print using QR CODE model 1 (old specification, used for maintaining compatibility).

PTR_BCS_OTHER + 4 : Print using QR CODE model 2.

3.7.1 Error Correction Level

Error correction level is fixed at 7%.

3.8 GS1 DataBar Printing

When printing GS1 DataBar, set the Symbology parameter to one of the following values.

PTR_BCS_GS1DATABAR	: Print using GS1 DataBar Omnidirectional
PTR_BCS_GS1DATABAR_S	: Print using GS1 DataBar Stacked Omnidirectional
PTR_BCS_GS1DATABAR_E	: Print using GS1 DataBar Expanded
PTR_BCS_GS1DATABAR_E_S	: Print using GS1 DataBar Expanded Stacked
PTR_BCS_OTHER + 7	: Print using GS1 DataBar Stacked.
PTR_BCS_OTHER + 8	: Print using GS1 DataBar Stacked Omnidirectional.
PTR_BCS_OTHER + 9	: Print using GS1 DataBar Expanded Stacked.

3.9 COMPOSITE Printing

When printing COMPOSITE, set the Symbology parameter to the following value.

HIWORD	: The constant value of PDF417
LOWORD	: The constant value of the barcode that will combine the value of PDF417.

3.9.1 Combinable Barcode

The settable barcode in the ROWORD is as follows.

- UPC-A
- UPC-E (Compressed format)
- UPC-E
- EAN 8
- EAN 13
- GS1 DataBar
- GS1 DataBar Truncated
- GS1 DataBar Stacked
- GS1 DataBar Stacked Omnidirectional
- GS1 DataBar Limited
- GS1 DataBar Expanded
- GS1 DataBar Expanded Stacked
- GS1 DataBar 128

3.10 Synchronous Processing

The TM-L100 use Process ID to determine output completion.

Use of the Process ID allows multiple print commands to be queued to the printer simultaneously. For this reason, Asynchronous output (AsyncMode = TRUE) gives a performance improvement.

3.11 Electronic Logo Function (NVRAM)

The TM-L100 feature an electronic logo function (NVRAM).

There are two ways of using NVRAM explained as follows:

1. Using TMFlogo Utility

Startup TMFlogo utility from “Device Specific Settings” dialog box of SetupPOS utility and register image files (BMP style) with NVRAM in advance. For the details of the registration, please refer to the “Help” of “TMFlogo utility” and/ or “EPSON OPOS ADK MANUAL User’s Manual TMFlogo Utility”.

To print image files registered with NVRAM, please use the either of the following DirectIO:

```
PTR_DI_FLASH_BITMAP
PTR_DI_FLASH_BITMAP2
```

Please refer to the Section 4 of “EPSON OPOS ADK MANUAL APPLICATION DEVELOPMENT GUIDE POSPrinter (TM Series)” for detail.

2. Using SetBitmap Method

Checking “NVRAM” check box on “Bitmap” tab in “Device Specific Settings” dialog box of SetupPOS utility enable to register image files with NVRAM using SetBitmap method.

Regarding the details of image files registration with NVRAM using SetBitmap method, please refer to the Section 8 of “EPSON OPOS ADK MANUAL APPLICATION DEVELOPMENT GUIDE POSPrinter (TM Series)”

The available size of NVRAM are as follows:

```
TM-L100      : 384KB
```

3.12 About paper removal waiting mechanism and operation.

TM-L100 has a model equipped with a "Paper Removal Standby".

If you execute the printing method without removing the paper after executing the paper cut, the following error is returned.

ResultCode:OPOS_E_EXTENDED

ResultCodeExtended:OPOS_EPTR_LABEL_REMOVAL

The error status is cleared by removing the paper.

Note the following points.

- The following peripheral devices may stop operating until the paper is removed after the paper is cut.
 - Customer display.
 - Buzzer(Internal, Option)

Remove the paper and it will resume working.

When using the buzzer, the buzzer can be sounded while waiting for paper removal by changing the "Buzzer Sound(Removal Standby)".

- If you cut the paper multiple times in one transaction, printing will not be performed after the cut until the paper is removed.

If you want to print continuously, disable this function.

The one transaction is as follows.

- Executing the escape sequence for the cut multiple times in the PrintNormal or PrintImmediate method.
- Executing the CutPaper method multiple times within the TransactionPrint method.

Section 4. MultiFont Printing

4.1 Overview

This function enables multilingual printing. The function is enabled by selecting “TM-L100” with SetupPOS.

4.2 Supported Methods

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

4.3 Supported Languages

- Alphanumeric
- Japanese
- Simple Chinese
- Traditional Chinese
- Korean
- Thai

4.4 Details of function

4.4.1 Priority Font

TM-L100 searches the print character code points in the following priority order.

The following is the default analysis priority of the language font of TM-L100.

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.

Section 5. Warnings

This section describes precautions in use of TM-L100.

- When the power is turned on or off while using a Bluetooth connection, the recovery process might take time to complete.
- It is recommended to run the autocutter operation after a minimum of 10 lines or 35 mm {1.38"} of printing or paper feeding. (This is to prevent small pieces of cut paper from dropping into the autocutter to cause paper jams. Also, when using the paper removal standby setting, it is difficult to remove paper after it is ejected.)