

EPSON OPOS ADK MANUAL

**APPLICATION DEVELOPMENT
GUIDE**

POSPrinter (TM-T88V)

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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-T88V Series POS Printers are used with the EPSON OPOS ADK program.

This manual applies to the following devices.

Device List

Serial	Parallel	USB	Ethernet	Bluetooth
TM-T88V	TM-T88VP	TM-T88VU	TM-T88VE	TM-T88VB
TM-T88VM	TM-T88VPM	TM-T88VMU	TM-T88VME	TM-T88VMB

Before reading the manual, see the following explanation about the characteristic of the TM-T88V models.

- TM-T88V, TM-T88VM
Station: Receipt (Line Thermal 180 dpi X 180 dpi)

Throughout the manual, the various model names will be referred to as TM-T88V.

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-T88V Series printers.

2.1 References of Firmware Versions

Refer to the release notes (Relnote.txt).

2.2 Settings of DIP Switches

Confirm that the following settings have been made correctly.

1) Serial port

DIP-SW1

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

DIP-SW2

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

It is possible to change the settings of DIP-SW1-1 (Processing of the data input error) and DIP-SW1-2 (Specification of the received buffer capacity), but it is recommended to leave them OFF.

Set DIP-SW1-3 (Handshake) to DTR/DSR.

Set DIP-SW1-4 (Bit length) to 8 bits.

Set DIP-SW1-5 to DIP-SW1-8 in accordance with the port information.

The described set values are the default values. For the details, refer to the product manual of the POSPrinter. Also, if these settings are changed, make sure to change the port information using the SetupPOS utility.

Set DIP-SW2-2 in accordance with whether or not a customer display is connected. If connected, set ON. If not, set OFF.

Set DIP-SW2-3 and DIP-SW2-4 (Specification of the print density) to match the environment of use.

Make other settings in accordance with the settings described above.

When using with the power saving mode, set DIP-SW2-3 and DIP-SW2-4 to ON.

2) Parallel Port

DIP-SW 1

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

DIP-SW 2

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

It is possible to change the settings of DIP-SW1-1 (Auto line feed) and DIP-SW1-2 (Specification of the received buffer capacity), but it is recommended to leave them OFF.

Set DIP-SW2-3 and DIP-SW2-4 (Specification of the print density) to match the environment of use.

Make other settings in accordance with the settings described above.

When using with the power saving mode, set DIP-SW2-3 and DIP-SW2-4 to ON.

3) USB Port

DIP-SW1

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

DIP-SW2

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

It is possible to change the settings of DIP-SW1-1 (Auto line feed) and DIP-SW1-2 (Specification of the received buffer capacity), but it is recommended to leave them OFF.

Set DIP-SW2-3 and DIP-SW2-4 (Specification of the print density) to match the environment of use.

Make other settings in accordance with the settings described above.

When using with the power saving mode, set DIP-SW2-3 and DIP-SW2-4 to ON.

4) Ethernet Port

DIP-SW1

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

Recommended
Recommended
Fixed at OFF
Fixed at OFF
Fixed at OFF
Fixed at OFF
Fixed at OFF
Fixed at OFF

DIP-SW2

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

Recommended
Fixed at OFF
Settable
Settable
Fixed at OFF
Fixed at OFF
Fixed at OFF
Fixed at ON

It is possible to change the settings of DIP-SW1-1 (Auto line feed) and DIP-SW1-2 (Specification of the received buffer capacity), but it is recommended to leave them OFF.

Set DIP-SW2-3 and DIP-SW2-4 (Specification of the print density) to match the environment of use.

Make other settings in accordance with the settings described above.

When using with the power saving mode, set DIP-SW2-3 and DIP-SW2-4 to ON.

5) Bluetooth Port**- TM-T88V with iOS Bluetooth**

DIP-SW1

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

Fixed at OFF
Fixed at OFF
Fixed at OFF
Fixed at OFF
Fixed at OFF
Fixed at OFF
Fixed at ON
Fixed at ON

DIP-SW2

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

Fixed at ON
Fixed at OFF
Settable
Settable
Fixed at OFF
Fixed at OFF
Fixed at OFF
Fixed at ON

Set DIP-SW2-3 and DIP-SW2-4 (Specification of the print density) to match the environment of use.

Make other settings in accordance with the settings described above.

When using with the power saving mode, set DIP-SW2-3 and DIP-SW2-4 to ON.

- TM-T88V with UB-B03

DIP-SW1

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

DIP-SW2

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

Set DIP-SW2-3 and DIP-SW2-4(Specification of the print density) to match the environment of use.

Make other settings in accordance with the settings described above.

When using with the power saving mode, set DIP-SW2-3 and DIP-SW2-4 to ON.

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

The default settings are as shown in the following table.

Item	Setting range
------	---------------

Baud rate [bps]	9600
Bit length [bit]	8
Parity	NONE
Stop bit [bit]	1
Handshake	DTR/DSR

2) Port information when using parallel port

Not applicable

3) Port information when using USB port

Not applicable

4) Port information when using Ethernet port

Not applicable

5) Port information when using Bluetooth port

Not applicable

2.4 Device Settings

The following explanation is about the settings for TM-T88V models.

2.4.1 Usable Device Specific Settings

For the TM-T88V models, the following device specific settings are settable by the SetupPOS utility. For the detail, please refer to the corresponding part of 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 ^{*1}
	Ignore firmware version check
	Output complete timeout [s]
Paper	Paper Type
	Paper Width [mm]: LineWidth [dot]: LineCharsList
Bitmap	TMFlogo...
Color Bitmap	Halftone: Method
	Halftone: Brightness
	Color: Primary
	Gradation: Method
Status Log	ERROR
	OFFLINE
	Log file name (full path name)
	Maximum file size [KB]
Default Value ^{*2}	Multilingual font
Printing Properties	Receipt Characters per Line
	Receipt Line Spacing [dots]
	CharacterSet [CodePage Number]

^{*1} The operations differ by the firmware versions. See the corresponding part of the section 2 of this manual.

^{*2} Available only for the Multilingual character model.

2.4.2 Multilingual font Setting

The TM-T88V Multilingual character models support the following font type.

- CHINA GB18030
- TAIWAN BIG-5
- VIETNAMESE
- THAI 3 PASS
- THAI 1 PASS

The default paper type is set to CHINA GB18030.

Section 3. Function Details

This section describes the functions of the TM-T88V models 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	Setting Value
CapTransaction	TRUE
CapCoverSensor	TRUE
CapConcurrentRecSlp	FALSE
CapConcurrentJrnSlp	FALSE
CapConcurrentJrnRec	FALSE
CapConcurrentPageMode	FALSE
CapCharacterSet	PTR_CCS_UNICODE ^{*1}
CapMapCharacterSet	TRUE ^{*2}
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	TRUE
CapRecMarkFeed	0
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 If CHINA GB18030 character model or TAIWAN BIG-5 character model or Thai 1 Pass character model, "PTR_CCS_KANJI" is set.

^{*2} If CHINA GB18030 character model or TAIWAN BIG-5 character model or Thai 1 Pass character model, "FALSE" is set.

3.1.2 List Properties

The List Properties are explained in the following.

List Property	Settings
CharacterSetList	(TM-T88V, TM-T88VM ^{*1*5}) "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, 998, 999, 1098, 1125, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258" (TM-T88VM ^{*2}) "120,121,126,130,131,437,997" ^{*3} "437, 874" ^{*4}
JrnLineCharsList	"6"
RecLineCharsList	79.5mm: (Font A) "42" (Font B) "56" 57.5mm: (Font A) "30" (Font B) "40"
SlpLineCharsList	"6"
RecBarCodeRotationList	"0,R90, L90, 180"
RecBitmapRotationList	"0,R90, L90, 180"
SlpBarCodeRotationList	"6"
SlpBitmapRotationList	"6"
FontTypefaceList	"6"

^{*1} If Multilingual character model, "936" or "950" is added to the list.

^{*2} Device is limited to South Asia model.

^{*3} Available only for Thai3 Pass mode and Vietnamese.

^{*4} Available only for Thai1 Pass mode.

^{*5} When the CapCharacterSet property is set to "PTR_CCS_UNICODE," "997" is added to the list. When CharacterSet is set to "997," all characters loaded in the device are allocated to Unicode for printing. However, the BinaryConversion property should be set to "OPOS_BC_NONE" when printing with Unicode.

3.1.3 Width and Height Properties

The width and height properties are described below.

Property	Settings		
	Default Value	Maximum value [dot]	Minimum value [dot]
RecLineSpacing	30	127	24 ^{*1}
JrnLineSpacing	X	X	X
SlpLineSpacing	X	X	X
SlpLineHeight [dot]	X		
RecLineHeight [dot]	(Font A) 24 (Font B) 17		
JrnLineHeight [dot]	X		
SlpLineWidth [dot]	X		
RecLineWidth [dot]	(79.5mm) 512 (57.5mm) 360		
JrnLineWidth [dot]	X		
RecSidewaysMaxLines	17 ^{*2}		
RecSidewaysMaxChars	(Font A) 138 (Font B) 184		
RecLinesToPaperCut	5 ^{*3}		
SlpSidewaysMaxLines	X		
SlpSidewaysMaxChars	X		
SlpMaxLines	X		

X: No settings

^{*1} When Font A is selected. 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 RecLineHeight.

^{*3} It can be changed by the settings of the RecLineSpacing or the character height.

3.1.4 Common Property Strings

The Device information properties are described below.

I/F	DeviceName	DeviceDescription
S	TM-T88V	EPSON TM-T88V POS Printer
	TM-T88VM	EPSON TM-T88VM POS Printer
P	TM-T88VP	EPSON TM-T88VP POS Printer
	TM-T88VPM	EPSON TM-T88VPM POS Printer
U	TM-T88VU	EPSON TM-T88VU POS Printer
	TM-T88VMU	EPSON TM-T88VMU POS Printer
E	TM-T88VE	EPSON TM-T88VE POS Printer
	TM-T88VME	EPSON TM-T88VME POS Printer
B	TM-T88VB	EPSON TM-T88VB POS Printer
	TM-T88VMB	EPSON TM-T88VMB POS Printer

I/F indicate the connected interface.

The following is the list of the four connecting interfaces.

S: Serial

P: Parallel

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	-	<monochrome> (79.5mm) "512", "1662" (57.5mm) "360", "1662"	-
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.

^{*2} If the Station's CapRecPageMode property value is FALSE, the PageModeArea property shall have " " and the PageModeDescriptor property shall have "0" respectively as a setting value.

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	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.

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
#lF	0~9999	O
#uF Base Pitch [inch]	0~ equiv. 50 cm	O
#rF Maximum [inch]	X	X
[*]#E	0~65535	X
#fT	X	X
bC	O	O
!bC	O	O
#uC	1~2	O
iC	X	X
!iC	X	X
#rC	1	O
rvC	O	O
!rvC	O	O
#sC	X	X
#fC	X	X
tbC	X	X
!tbC	X	X
tpC	X	X
!tpC	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	1	1
!stC	O	O
*#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-T88V 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
- QR CODE
- 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

3.5 MAXI CODE Printing

3.5.1 Symbology Parameter

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.

3.5.2 Printing Size

Because the size of MAXI CODE is fixed, printing is done at a fixed size that is unaffected by the Width and Height parameters. An error occurs only when the Width and Height parameters fall below zero. If the two dimensional barcode cannot fit into the print area (depending on the paper width, layout settings, etc.) then OPOS_E_ILLEGAL is returned and at this moment ResultCodeExtended becomes zero.

3.5.3 Printing Position

Like the one dimensional barcode, the print position of the two dimensional barcode is the specified position.

3.5.4 Data Format

3.5.4.1 Mode 2

In the case of mode 2, because the format of header + primary message + secondary message is fixed, data for the Data parameter must follow this format.

The header part contains the following data, which can be omitted.

"[> RS 01 GS yy" (In hexadecimal: 0x5B 0x29 0x3E 0x1E 0x30 0x31 0x1D 0x.. 0x..)

yy is '0' to '9' (0x30 to 0x39)

The primary message part contains the following data.

"Postal Code" GS "ISO Country Code" GS "Service Class Code" GS

Field	Length (byte)	Type
Postal Code	1 to 9	Number (0x30 to 0x39)
ISO Country Code	1 to 3	Number (0x30 to 0x39)
Service Class Code	1 to 3	Number (0x30 to 0x39)

For the secondary message, you can freely specify any data from 0x01 to 0xFF, and the data can be omitted. Since the length of the encoded data is not known, the data length cannot be correctly verified. For this reason, if the printer determines, after examining the original data length, that the data can more or less be printed, it tries to print the data; if the length is more than that, then an error occurs. (For the secondary message, an error occurs if the data length is more than 70 bytes.)

3.5.4.2 Mode 3

In the case of mode 3, except for the format of the primary message, it is same as mode 2. The primary message of mode 3 has the following type of data.

"Postal Code" GS "ISO Country Code" GS "Service Class Code" GS

Field	Length (byte)	Type
Postal Code	1 to 6	Number (0x30 to 0x39) A-Z space "\$%&'()*+,-./
ISO Country Code	1 to 3	Number (0x30 to 0x39)
Service Class Code	1 to 3	Number (0x30 to 0x39)

3.5.4.3 Modes 4 and 5

0x01 to 0xFF can be specified to the Data parameter, and there is no restriction on the format. Since the length of the encoded data is not known, the data length cannot be correctly verified. For this reason, if the printer determines, after examining the original data length, that the data can more or less be printed, it tries to print the data; if the length is more than that, then an error occurs. (An error occurs if Data is zero byte or more than 80 bytes.)

Mode 4 differs from mode 5 in the error correction level. As much as possible, OPOS uses the higher error correction level. Therefore, if the data amount is small (less than 50 bytes), OPOS uses mode 5 (the one with a higher error correction level).

3.5.4.4 Mode 6

0x01 to 0xFF can be specified to the Data parameter, and there is no restriction on the format. Since the length of the encoded data is not known, the data length cannot be correctly verified. For this reason, if the printer determines, after examining the original data length, that the data can more or less be printed, it tries to print the data; if the length is more than that, then an error occurs. (An error occurs if Data is zero byte or more than 80 bytes.)

3.6 QR CODE Printing

3.6.1 QR CODE Printing

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

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.

3.6.2 Printing Size

Because the width and length of QR CODE are the same, printing is done to the inner part at a size closest to it by using the value specified by the Width parameter. Therefore, the height of print is not affected by the Height parameter. If the Height parameter is less than 0, an error occurs.

The print size is determined by the version of QR and the size of the module. Because the version of QR is determined by the data length and type, you can use the size of the module to adjust the print size. If the two dimensional barcode cannot fit into the print area (depending on the paper width, layout settings, etc.) then OPOS_E_ILLEGAL is returned and at this moment ResultCodeExtended becomes zero.

For QR, it differs from other two dimensional barcodes; if the encoded data result is not known, then the print width cannot be obtained. If the print width cannot be obtained, the page mode range for 90-degree rotated printing cannot be specified. Therefore, within OPOS it calculates the number of code words of the encoded data. Because of this reason, data amount can be correctly verified.

3.6.3 Error Correction Level

Error correction level is fixed at 7%.

3.6.4 Printing Position

Like the one dimensional barcode, the print position of the two dimensional barcode is the specified position.

3.7 GS1 Printing (two dimension)

3.7.1 Symbology Parameter

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

PTR_BCS_GS1DATABAR_S :Print using GS1 DataBar Stacked Omnidirectional

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.

3.7.2 Printing Size

Printing is done to the inner part at a size closest to it by using the value specified by the Width parameter. Therefore, the height of print is not affected by the Height parameter. If the Width and Height parameters are less than 0, an error occurs. Because the printing size is determined by the data length ^{*1} and barcode type, you can use the size of the module to adjust the print size.

If the two dimensional barcode cannot fit into the print area (depending on the paper width, layout settings, etc.) then OPOS_E_ILLEGAL is returned and at this moment ResultCodeExtended becomes 0.

^{*1} Available only for the GS1 DataBar Expanded Stacked.

3.7.3 Printing Position

Like the one dimensional barcode, the print position of the two dimensional barcode is the specified position.

3.7.4 Data Format

[Setting range of data]

Symbology	Length (byte)	Characters that can be specified
GS1 DataBar Stacked	13	0x30-0x39
GS1 DataBar Stacked Omnidirectional	13	0x30-0x39 (The first character is limited to 0x30 or 0x31.)
GS1 DataBar Expanded Stacked	2 to 255	0x20-0x22, 0x25-0x3f, 0x41-0x5a, 0x5F, 0x61-0x7a (The first two characters are limited to 0x30-0x39. Or if the first character is 0x28, the second and the third characters are limited to 0x30-0x39.)

[Special characters of GS1 DataBar 128]

Special characters	ASCII
FNC1	{1
'('	{{
')'	}

3.8 COMPOSITE Printing

3.8.1 Symbology Parameter

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.

3.8.1.1 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

3.8.2 Printing Size

Printing is done to the inner part at a size closest to it by using the value specified by the Width parameter.

Therefore, the height of print is not affected by the Height parameter. If the Width and Height parameters are less than 0, an error occurs.

Because the printing size is determined by the data length and composite barcode type, you can use the size of the module to adjust the print size.

If the two dimensional barcode cannot fit into the print area (depending on the paper width, layout settings, etc.) then OPOS_E_ILLEGAL is returned and at this moment ResultCodeExtended becomes 0.

3.8.3 Printing Position

Like the one dimensional barcode, the print position of the two dimensional barcode is the specified position.

3.8.4 Data Format

The range designation of the HIWORD data is as follows.

Symbology	Length (byte)	Characters that can be specified
PDF417	3 to 2361	0x20-0x22, 0x25-0x3f, 0x41-0x5a, 0x5f, 0x61-0x7a

The range designation of the ROWORD data is as follows.

Symbology	Length (byte)	Characters that can be specified
UPC-A	11	0x30-0x39
UPC-E (Compressed format)	6	0x30-0x39
UPC-E	11	0x30-0x39 (The first character is limited to 0x30.)
EAN 8	7	0x30-0x39
EAN 13	12	0x30-0x39
GS1 DataBar	13	0x30-0x39
GS1 DataBar Truncated	13	0x30-0x39
GS1 DataBar Stacked	13	0x30-0x39
GS1 DataBar Stacked Omnidirectional	13	0x30-0x39 (The first character is limited to 0x30 or 0x31.)
GS1 DataBar Limited	13	0x30-0x39 (The first character is limited to 0x30 or 0x31.)
GS1 DataBar Expanded	2 to 255	0x20-0x22, 0x25-0x3f, 0x41-0x5a, 0x5f, 0x61-0x7a (The first two characters are limited to 0x30-0x39. Or if the first character is 0x28, the second and the third characters are limited to 0x30-0x39.)
GS1 DataBar Expanded Stacked	2 to 255	0x20-0x22, 0x25-0x3f, 0x41-0x5a, 0x5f, 0x61-0x7a (The first two characters are limited to 0x30-0x39. Or if the first character is 0x28, the second and the third characters are limited to 0x30-0x39.)
GS1 DataBar 128	3 to 255	0x00-0x7f

[Special characters of Barcodes (GS1 DataBar 128, GS1 DataBar Expanded and GS1 DataBar Expanded Stacked)]

Special characters	ASCII
FNC1	{1
FNC3	{3
{'	{{
{({{(
{')	{})
{*}	{*

3.9 Power Condition Reports

The TM-T88V models support Power Condition Reports as follows.

Powered on reporting: Supported

Powered off reporting: Unsupported

3.10 Synchronous Processing

The TM-T88V models 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 Printing Positions

The TM-T88V models support the function for setting printing position.

Function	Receipt
Left margin	O
Printing Position	O

O: Supported

X: Unsupported

When the left margin setting function is supported, it is possible to specify the horizontal printing position of the bitmap or barcode by dots unit.

When the printing position settings are supported, it is possible to specify the horizontal printing position of the text, bitmap, or the barcode to the left, center, or the right side of the paper.

3.12 Electronic Logo Function (NVRAM)

The TM-T88V models feature an electronic logo function (NVRAM). To use NVRAM, start up TMFlogo utility from “Device Specific Settings” of SetupPOS utility, and register image files (BMP style) with NVRAM in advance.

For the details of the registration, please refer to the “TM-T88V Utility User's Manual”.

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 corresponding part of the Section 4 of “EPSON OPOS ADK MANUAL APPLICATION DEVELOPMENT GUIDE POSPrinter (TM Series)” for detail. The available NVRAM sizes are as follows:

TM-T88V : 262144 bytes

3.13 Printable bitmap types and sizes

The TM-T88V models support the following bitmap commands. For the detail, please refer to the corresponding part of the Section 3 of “EPSON OPOS ADK MANUAL APPLICATION DEVELOPMENT GUIDE POSPrinter (TM Series)”. The allowance ranges for bitmaps are as follows.

Bitmap command type	Allowance range		
	X (dot)	y (dot)	xy
Download bitmap	1~2040	1~384	<= 98304
Raster bitmap	1~2048	1~2303	
One-line bitmap	No setting range		

3.14 Maintenance Counter

The TM-T88V models feature a maintenance counter function for retaining an operation log of the printer.

The following chart shows the available maintenance counters for the TM-T88V models.

Counter number Hexadecimal	Counter	Unit	Max. Value	Counter Type
14	Paper feed in number of lines: Roll paper	Lines	143,165,576	Resettable
15	Number of times head timing pulse: Roll paper	Times	4,294,967,295	Resettable
32	Number of auto-cutter operations	Times	4,294,967,295	Resettable
46	Uptime of product	Hours	71,582,788	Resettable
94	Number of paper feed lines: Roll paper	Lines	143,165,576	Cumulative
95	Number of times head timing pulse: Roll paper	Times	4,294,967,295	Cumulative
B2	Number of auto-cutter operations	Times	4,294,967,295	Cumulative
C6	Uptime of product	Hours	71,582,788	Cumulative

3.15 Automatic Recovery Function

The TM-T88V models feature a function for automatic recovery when the power is turned on again after an interruption of power. Recovery processing is performed automatically when the printer's power is turned on again after an interruption. The recovery processing restores the printer to the condition it was in before the power was turned off.

3.16 Output without Flow Control on the USB/Ethernet Interfaces

The TM-T88V models support outputting without flow control on the USB/Ethernet interfaces. The operations differ by the firmware versions. See the corresponding part of the section 2 of this manual.

Section 4. Warnings

This section describes precautions in use of TM-T88V models.

- When using the network connection, always use a UB-E02 or UB-R02 interface board. If a device is connected via other interface board, Epson will not be responsible for any consequences.
- Thai1 Pass mode printing:
If print data remains in the printer buffer when printing is executed (i.e. The line feed for the print data was not completed), it is possible that the result will not be printed correctly.
- When the power is turned on or off while using a Bluetooth connection, the recovery process might take time to complete.