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EPSON OPOS ADK MANUAL

APPLICATION DEVELOPMENT GUIDE

POSPrinter (TM-T90)

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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-T90 Series POS Printers are used with the EPSON OPOS ADK program.

This manual applies to the following devices.

Device List

Serial	Parallel	USB	Ethernet
TM-T90	TM-T90P	TM-T90U	TM-T90E
TM-T90M	TM-T90PM	TM-T90MU	TM-T90ME

Before reading the manual, see the following explanation about the characteristic of the TM-T90 models.
- Station: Receipt (Line Thermal 180 dpi X 180 dpi)
- 2-Color Printing

Throughout the manual, the various model names will be referred to as TM-T90.

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-T90 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	Settable
2	ON	Settable
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	Fixed at OFF

Set DIP-SW1-1 (Power button function).

If this DIP Switch is ON, the power button is disabled.

Set DIP-SW1-2 (Interface condition selection).

If this DIP Switch is ON, communications settings are set via DIP Switches. If the DIP Switch is OFF, Memory Switches are used.

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 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.

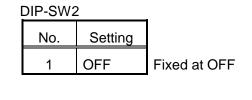Do not change the current settings of DIP-SW2-1.

2) Parallel Port

DIP-SW1

No.	Setting
1	OFF	Settable
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	OFF	Fixed at OFF
8	OFF	Fixed at OFF

DIP-SW2

No.	Setting
1	OFF	Fixed at OFF

Set DIP-SW1-1 (Power button function).

If this DIP Switch is ON, the power button is disabled.

Do not change the current settings of DIP-SW2-1.

Make other settings in accordance with the settings described above.

3) USB Port

DIP-SW1

No.	Setting
1	OFF	Settable
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	OFF	Fixed at OFF
8	OFF	Fixed at OFF

DIP-SW2

No.	Setting
1	OFF	Fixed at OFF

Set DIP-SW1-1 (Power button function).

If this DIP Switch is ON, the power button is disabled.

Do not change the current settings of DIP-SW2-1.

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Make other settings in accordance with the settings described above.

4) Ethernet Port

DIP-SW1   DIP-SW2

No.	Setting	
1	OFF	Settable
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	OFF	Fixed at OFF
8	OFF	Fixed at OFF

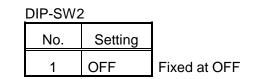| No.	Setting	
1	OFF	Fixed at OFF

Set DIP-SW1-1 (Power button function).

If this DIP Switch is ON, the power button is disabled.

Do not change the current settings of DIP-SW2-1.

Make other settings in accordance with the settings described above.

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 [*1], 57600 [*1],115200 [*1]
Bit length [bit]	8
Parity	NONE, ODD, EVEN
Stop bit [bit]	1
Handshake	DTR/DSR
Output buffer length [byte]	32 to 1024
Output interval time [ms]	0 to 9999

[*1] These Baud rate require setting via Memory Switch.

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The default settings are as shown in the following table.

Item	Setting range
Baud rate [bps]	19200
Bit length [bit]	8
Parity	NONE
Stop bit [bit]	1
Handshake	DTR/DSR
Output buffer length [byte]	1024
Output interval time [ms]	2500

2) Port information when using parallel port

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

Item	Setting range
Output buffer length [byte]	32 to 1024
Output interval time [ms]	0 to 9999

The default settings are as shown in the following table.

Item	Setting range
Output buffer length [byte]	1024
Output interval time [ms]	2500

3) Port information when using USB port

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

Item	Setting range
Output interval time [ms]	0 to 9999

The default setting is as shown in the following table.

Item	Setting range
Output interval time [ms]	2500

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4) Port information when using Ethernet port

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

Item	Setting range
Output buffer length [byte]	32 to 1024
Output interval time [ms]	0 to 9999

The default settings are as shown in the following table.

Item	Setting range
Output buffer length [byte]	1024
Output interval time [ms]	2500

2.4 Device Settings

The following explanation is about the settings for TM-T90.

2.4.1 Usable Device Specific Settings

For the TM-T90, 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
	Ignore firmware version check
	Homogenize Error Codes
	Output complete timeout
Paper	Paper Type
	Paper Width [mm]: LineWidth [dot]: LineCharsList
Bitmap	TMFlogo...
Color Bitmap	Method
	Brightness
	Primary
	Secondary

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Status Log	ERROR
	OFFLINE
	Log file name (include full path)
	Maximum file size [KB]
Default Value [*1]	Multilingual font

[*1] Available only for the Multilingual character model.

2.4.2 Paper Type Setting

The TM-T90 models support the following paper type. After adding the TM-T90 by the SetupPOS utility, open the "Device Specific Settings" dialog box.   In the "Paper" tab the paper type could be selected..

The settable paper types are as follows:

- Normal
- 2-Color Thermal

The default paper type is set to Normal.

2.4.3 Paper Width Setting

The TM-T90 models support the following paper width. After adding the TM-T90 by the SetupPOS utility, open the "Device Specific Settings" dialog box.   In the "Paper" tab the paper width could be selected..

The settable paper widths are as follows:

- 79.5 mm [512 dots]
- 59.5 mm [384 dots]
- 57.5 mm [360 dots]

The default paper width is set to 79.5 mm.

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Section 3.   Function Details

This section describes the functions of the TM-T90 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_ASCII [1]
CapMapCharacterSet	FALSE
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 PTR_COLOR_CUSTOM1 [2]
CapRecCartridgeSensor	0
CapRecBold	TRUE
CapRecBitmap	TRUE
CapRecBarCode	TRUE
CapRec2Color	TRUE [2]
CapRecPresent	TRUE
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

[1] If Multilingual character model, "PTR_CCS_KANJI" is set.

[2] Accordance with the selected paper in the SetupPOS utility, the set value will differ.

When selecting Normal Paper (Default), two colors print cannot be executed.

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3.1.2 List Properties

The List Properties are explained in the following.

List Property	Settings
CharacterSetList	"255,437,850,852,858,860,863,865,866,998,999, 1252" **[1]**
JrnLineCharsList	""
RecLineCharsList (When 79.5 mm is set)	"42,56"
RecLineCharsList (When 59.5 mm is set)	"32,42"
RecLineCharsList (When 57.5 mm is set)	"30,40"
SlpLineCharsList	""
RecBarCodeRotationList	"0,R90, L90, 180"
RecBitmapRotationList	"0,R90, L90, 180"
SlpBarCodeRotationList	""
SlpBitmapRotationList	""
FontTypefaceList	""

[1] If Multilingual character model, "936" or "950" is added to the list.

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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	127	24 [*1]
JrnLineSpacing	X	X	X
SlpLineSpacing	X	X	X
SlpLineHeight [dot]	X		
RecLineHeight [dot]	24,17		
JrnLineHeight [dot]	X		
SlpLineWidth [dot]	X		
RecLineWidth [dot] (When 79.5 mm is set)	512		
RecLineWidth [dot] (When 59.5 mm is set)	384		
RecLineWidth [dot] (When 57.5 mm is set)	360		
JrnLineWidth [dot]	X		
RecSidewaysMaxLines	17 [*3]		
RecSidewaysMaxChars (When Font A is selected)	138 [*4]		
RecSidewaysMaxChars (When Font B is selected)	184 [*4]		
RecLinesToPaperCut	5 [*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.

[*4] It can be changed by the settings of the font width, or the selected paper type.

3.1.4 Common Property Strings

The Device information properties are described below.

I/F	DeviceName	DeviceDescription
S	TM-T90	EPSON TM-T90 POS Printer
	TM-T90M	EPSON TM-T90M POS Printer
P	TM-T90P	EPSON TM-T90P POS Printer
	TM-T90PM	EPSON TM-T90PM POS Printer
U	TM-T90U	EPSON TM-T90U POS Printer
	TM-T90MU	EPSON TM-T90MU POS Printer
E	TM-T90E	EPSON TM-T90E POS Printer
	TM-T90ME	EPSON TM-T90ME 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

3.1.5 PageMode Print Properties

The Device information properties are described below.

Property	Station [2]		
	Journal	Receipt	Slip
PageModeArea	-	(monochrome) (80.0mm)"512", "831" (60.0mm)"384", "831" (58.0mm)"384", "831" (2-color) (80.0mm)"512", "415" (60.0mm)"384", "415" (58.0mm)"360", "415"	-
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.

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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 [*2]
PrintBarCode	O	O [*3]
PrintBitmap	O	O [*4]
PrintMemoryBitmap	O	O [*4]
CutPaper	O (1~100: One point remains uncut / Full cut [*1])	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

O: Supported

X: Unsupported

[*1] Full cut (completely cut) is possible as a dealer option.

[*2] 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.

[*3] 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.

[*4] 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.

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3.3 Escape Sequences

The following figure is about supported/unsupported Escape Sequences.

Escape Sequence	Receipt	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	0~ approx. 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	1~2 [*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 [*2]
rA	O	O [*2]
lA	O	O
N	O	O

O : Supported

X : Unsupported

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Numbers: Settable range

*1 When selected paper is Normal Paper, its settable range is 1.

*2 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-T90 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
- PDF 417

For the PDF 417 type, the maximum height is limited to 831 dots for 2-color thermal paper, 1662 dots for normal thermal paper.

3.5　Power Condition Reports

The TM-T90 models support Power Condition Reports as follows.

Powered on reporting: Supported

Powered off reporting: Supported

3.6　Synchronous Processing

The TM-T90 models support the Process ID for the Synchronous Processing.

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3.7 Printing Positions

The TM-T90 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.

3.8 Electronic Logo Function (NVRAM)

The TM-T90 models feature a function for electronic logo. To use the electronic logo function (NVRAM), start "TMFlogo utility" from the "Device Specific Settings" of SetupPOS utility, and register image files (BMP style) at the function 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 the registered image file, please use the following DirectIO.

PTR_DI_FLASH_BITMAP

PTR_DI_FLASH_BITMAP2

For the details of the printing, please refer to the Section 4 of "EPSON OPOS ADK APPLICATION DEVELOPMENT GUIDE POSPrinter (TM Series)". The available NVRAM size for the TM-T90 is 393216 bytes.

3.9 Printable Bitmap Types and Sizes

The TM-T90 models support the following bitmap commands. For the detail, please refer to 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		
Download bitmap	x (x x 8 dots)	y (y x 8 dots)	xy
	1~2040	1~384	Receipt: <= 98304
Raster bitmap	1~1024	1~4095	
Color bitmap	1~1024	(TM^T90) 1~415 (TM^T90M) 1~369	

- Even if meet with the limitation described above, a bitmap that extend the paper width cannot be printed.
- When a height of the raster bitmap expands the value described above, the SO (Service Object) will automatically separates the bitmap data into multiple bitmaps, then print the multiple bitmaps data as one connected bitmap.

3.10 Color Bitmap Printing

The TM-T90 models support color bitmap printing.

If a 16-color or a 256-color bitmap file is supplied, the image may be printed using 2 colors. If the original file is a 2-color bitmap, it will be printed in monochrome. The halftone method may be set using the "Device Specific Settings" dialog box.

To print an image using 2 colors, 2-color thermal paper must be selected in the "Device Specific Settings" dialog box and 2-color thermal receipt paper must be supplied in the printer.

3.11 Maintenance Counter

The TM-T90 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-T90.

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 head energizations: 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 head energizations: 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

3.12 Automatic Recovery Function

The TM-T90 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.

3.13 Output without Flow Control on the USB/Ethernet Interfaces

The TM-T90 models support outputting without flow control on the USB/Ethernet interfaces.

Section 4.   Warnings

This section describes precautions in use of TM-T90.

- If 2-color thermal paper is selected from the "Device Specific settings" dialog box, 2-color thermal receipt paper must be used in the printer.
- When parallel I/F is used with Windows 2000, Windows XP or Windows Vista, please set Busy Condition of Memory SW1-3 to "ON" (Buffer full).

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