

EPSON OPOS ADK MANUAL

APPLICATION DEVELOPMENT GUIDE

MICR (EPSON TM Series)

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Section 1. Introduction

This manual describes the method of use and related items, including device-specific precautions, when the MICR device is used with EPSON OPOS ADK.

Before the MICR can be used, the EPSON OPOS ADK should be installed and the devices to be used should be set using the SetupPOS utility. For setting methods, please see the Section 2.

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 MICR devices.

2.1 Device Information

The DeviceDescription and DeviceName for each model are as follows.

Model Name	I/F	DeviceDescription	DeviceName
TM-U675	S	EPSON TM-U675 MICR	TM-U675
	P	EPSON TM-U675P MICR	TM-U675P
	U	EPSON TM-U675U MICR	TM-U675U
	E	EPSON TM-U675E MICR	TM-U675E
TM-H5000II	S	EPSON TM-H5000II MICR	TM-H5000II
	P	EPSON TM-H5000IIP MICR	TM-H5000IIP
	U	EPSON TM-H5000IIU MICR	TM-H5000IIU
	E	EPSON TM-H5000IIE MICR	TM-H5000IIE
TM-H6000III	S	EPSON TM-H6000III MICR	TM-H6000III
	P	EPSON TM-H6000IIIP MICR	TM-H6000IIIP
	U	EPSON TM-H6000IIIU MICR	TM-H6000IIIU
	E	EPSON TM-H6000IIIE MICR	TM-H6000IIIE
TM-J7000	S	EPSON TM-J7000 MICR	TM-J7000
	P	EPSON TM-J7000P MICR	TM-J7000P
	U	EPSON TM-J7000U MICR	TM-J7000U
	E	EPSON TM-J7000E MICR	TM-J7000E
TM-J7100	S	EPSON TM-J7100 MICR	TM-J7100
	P	EPSON TM-J7100P MICR	TM-J7100P
	U	EPSON TM-J7100U MICR	TM-J7100U
	E	EPSON TM-J7100E MICR	TM-J7100E
TM-U950	S	EPSON TM-U950 MICR	TM-U950
TM-H2000	S	EPSON TM-H2000 MICR	TM-H2000
	P	EPSON TM-H2000P MICR	TM-H2000P
	U	EPSON TM-H2000U MICR	TM-H2000U
	E	EPSON TM-H2000E MICR	TM-H2000E
TM-H6000IV	S	EPSON TM-H6000IV MICR	TM-H6000IV
	P	EPSON TM-H6000IVP MICR	TM-H6000IVP
	U	EPSON TM-H6000IVU MICR	TM-H6000IVU
	E	EPSON TM-H6000IVE MICR	TM-H6000IVE
TM-H6000V	S	EPSON TM-H6000V MICR	TM-H6000V
	P	EPSON TM-H6000VP MICR	TM-H6000VP
	U	EPSON TM-H6000VU MICR	TM-H6000VU
	E	EPSON TM-H6000VE MICR	TM-H6000VE
	B	EPSON TM-H6000VB MICR	TM-H6000VB

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

2.2 References of Firmware Versions

Refer to the release notes (Relnote.txt).

2.3 Settings of DIP Switches and Hardware

There are no Dip Switch settings for the MICR. Refer to the manual of currently used Printer for settings of the Printer.

2.4 Setting of Devices

The SetupPOS utility should be used for setting devices. Regarding how to use the SetupPOS utility, please refer to the "EPSON OPOS ADK MANUAL User's Manual (Installer/ SetupPOS/ TMUSB)".

1) Setting of Parallel interface devices

When the SetupPOS utility is used to select the device when using a Parallel port, select devices with "P" appended to the end of the device name.

Example: TM-H6000IIIP

2) Setting of USB interface devices

When the SetupPOS utility is used to select the device when using an USB port, select devices with “U” appended to the end of the device name.

Example: TM-H6000IIIU

3) Setting of Ethernet interface devices

When the SetupPOS utility is used to select the device when using an Ethernet port, select devices with “E” appended to the end of the device name.

Example: TM-H6000IIIE

4) Setting of Bluetooth interface devices

When using a printer with Bluetooth I/F specifications, Select the COM port of the Bluetooth device in the Create New window of TMPORT.

Notes: Bluetooth interface only support TM-H6000V.

5) Device Specific Settings

MICR's specific setting should be done after specifying the Device to use in “Device Specific Settings” dialog box of SetupPOS Utility. The following items are able to set in the dialog box.

- Error handling options during Check insertion
- Check Font
- Regarding how to set with “Device Specific Settings”, please refer to “EPSON OPOS ADK MANUAL User's Manual (Installer/ SetupPOS/ TMUSB)”.

- “Error handling options during Check insertion setting.”

Sets how you want to be notified if an error is fired during Check insertion.

- “Issue an Error Event for every error occurrence during Check insertion. (applicable for UPOS 1.7 and subsequent releases)” radio button (here after, referred without (applicable for UPOS 1.7 and subsequent releases))

Under the setting that this button is marked, EndInsertion method is considered to be succeed when check insertion by execution of EndInsertion method is done normally, regardless of whether the read data is illegal.

The conditions of the read data and reading operation of MICR are

notified by events.

This operation is the UPOS Release 1.7 and subsequent releases applied operation.

- “Issue an Error Event for specified error occurrence during Check insertion.” radio button

Under the setting that this button is marked, EndInsertion method is considered to be succeeded upon normal completion of analysis of the data that is read from a check inserted by the method.

When the read data of MICR is normal or the data contains not analyzable characters, these conditions are notified by events. Whether the read data and reading operation of MICR are illegal are indicated by the set value of ResultCode and ResultCodeExtended properties.

This operation is the same as the default operation of UPOS Release 1.6 (previous versions of Ver. 2.30) applied operation.

Default setting of above radio buttons is “Issue an Error Event for every error occurrence during Check insertion.”.

Regarding the variety of events and values of ResultCode and ResultCodeExtended are described, please refer to the Section 8 of this manual.

- “Automatic check remove on read error” check box:
This check box setting can be done only when “Issue an Error Event for specified error occurrence during Check insertion.” radio button under “Error handling options during Check insertion” is selected.
This check box is inapplicable when “Issue an Error Event for every error occurrence during Check insertion.” is selected.

When a read data is in those conditions as below, the check is removed:

1. The entire data is incorrect. (Neither an incorrect insertion, nor an incorrect sheet, etc.)
2. Longer than the prescribed length
3. Blank check sheet

If one of the data is read as “?”, the check will not be removed.

For the EPSON TM-U950, this setting is the default and cannot be changed.

The TM-U950 cannot translate error data as “?”.

- “Fire ErrorEvent on check digit parity error” check box:
This check box setting can be done only when “Issue an Error Event for specified error occurrence during Check insertion.” radio button under “Error handling options during Check insertion” is selected.
This check box is inapplicable when “Issue an Error Event for every error occurrence during Check insertion.” is selected.

Judging whether a TransitNumber (nine digits number) is normal. If it is illegal, then notified by the ErrorEvent (RCE = OPOS_EMICR_DIGITERROR).

It can be executed only when the whole data is read normally, and the TransitNumber has nine digits number.

- “Check font”
Sets the read font for reading checks. Selects a type of the check to be used.
Reads checks and analyzes the read data, then sets them to its properties.
 - “E-13B” radio button
 - “CMC7” radio buttonDefault setting is “E-13B”.

2.5 Port Information

1) Port information when using serial port

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

Setting Information	Effective Setting Range
Baud rate	1200 ^{*1} , 2400 ^{*2} , 4800, 9600, 19200 ^{*3} , 38400 ^{*4} , 57600 ^{*5} , 115200 ^{*6}
Bit length	7 bits, 8 bits
Parity	NONE, ODD, EVEN
Stop bit	1 bits
Handshake	DTR/DSR
Input buffer length	32-8192
Output buffer length	32-1024
Output interval time	0-9999
Input sleep time	0-99

^{*1} The 1200-baud rate can only be set for TM-U950.

^{*2} The 2400-baud rate cannot be set for TM-H6000III.

^{*3} The 19200-baud rate cannot be set for TM-U950.

^{*4} The 38400-baud rate cannot be set for TM-H5000II, TM-U675, TM-U950.

^{*5} The 57600-baud rate can only be set for TM-J7000, TM-J7100, TM-H6000IV, TM-H2000 and TM-H6000V.

^{*6} The 115200-baud rate can only be set for TM-J7000, TM-J7100, TM-H6000IV, TM-H2000 and TM-H6000V.

The default settings are as shown in the following table.

Setting Information	Set value
Baud rate	9600 ^{*1} , 19200, 38400 ^{*2}
Bit length	8 bits
Parity	NONE
Stop bit	1 bit
Handshake	DTR/DSR
Input buffer length	1024
Output buffer length	1024
Output interval time	1000
Input sleep time	10

^{*1} The 9600-baud rate can only be set for TM-H5000II and TM-U950.

^{*2} The 38400 baud rate can only be set for TM-H6000V.

All MICR settings are exactly the same as the printer.

2) Port information when using parallel port

All MICR settings are exactly the same as the printer.

3) Port information when using USB port

All MICR settings are exactly the same as the printer.

4) Port information when Ethernet port is used

All MICR settings are exactly the same as the printer.

5) Port information when Bluetooth port is used

All MICR settings are exactly the same as the printer.

Section 3. Function Details

This section describes the functions of the MICR device in details. Supplementary explanation of the parts not described in detail in UPOS is also given here.

3.1 CheckHealth Method

3.1.1 Internal Test

Checks whether the MICR can establish a communication and returns a result.

When the method is executed by OPOS_CH_INTERNAL, the character string of the CheckHealthText property is as follows.

“Internal Hcheck: Complete” : CheckHealthText

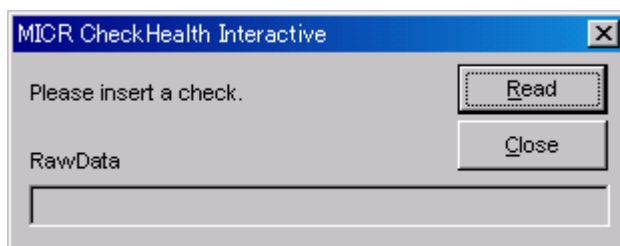
After executing the CheckHealth method, be sure to confirm the return value. If an error has occurred, there is no point in referring to the CheckHealthText property. For details on the error, refer to the Section 6 of this manual.

3.1.2 External Test

Not supported

3.1.3 Interactive Test

Executes interactive CheckHealth test. When executed, the following dialog box is displayed.



When the dialog box is displayed, press the [Read] button. If the Check is present, please first remove and then set the check in slip station.

If a check has been set correctly, data will be read. If a check is not set, a message requesting for inserting a check will be displayed. After inserting the check, press the [OK] button. Then the check is read.

The read data will be displayed as the RawData as follows:

RawData: xxxxxx xxxxxx

Confirm the contents.

When the method is executed by OPOS_CH_INTERACTIVE, the character strings of the CheckHealthText property are as follows.

“Interactive Hcheck: Canceled” : When the [Close] button is pressed without executing the [Read].

“Interactive Hcheck: Complete” : When the [Close] button is pressed after executing the [Read].

After executing the CheckHealth method, be sure to confirm the returned value. If an error has occurred, there is no point in referring to the CheckHealthText property. For details on the error, refer to the Section 6 of this manual.

3.2 Property Set values and Default Values

3.2.1 Capability Set Value

Capability Name	Set Value *1	Set Value
CapValidationDevice	FALSE	TRUE
CapPowerReporting	See the table1.	

*1 For TM-U675 and the TM-H6000II/ TM-H6000III/ TM-H6000IV/ TM-H6000V/ TM-J7000/ TM-J7100 (EndorsUnit unsupported) only.

Table 1

Port Type	CapPowerReporting
Serial	OPOS_PR_STANDARD
Parallel	OPOS_PR_ADVANCED
USB	OPOS_PR_ADVANCED
Ethernet	OPOS_PR_ADVANCED
Bluetooth	OPOS_PR_STANDARD

3.3 Supplementary Explanation of Functions

3.3.1 Valid Headers

The MICR sets data read from a check in its properties. If a data read by the check is invalid, the NULL is set in the property. Property that has a NULL value is an invalid data.

The EPSON TM series supports the following properties for E-13B and CMC7 type checks. The check type to read is set with the SetupPOS utility; dynamic changing of check type is not supported. The symbols shows in the below explanations are substitute characters for numeric values, and property names are fields that hold the substitute characters after the data is divided. For further information about substitute characters, please consult the “MICR Character Substitution” section of the “UPOS”.

Property Name	Length	Standard Settings	Symbol
AccountNumber	Over 6	A string parsed from the read MICR data. It is defined the section between the TransitNumber field and the On-Us Symbol. If a Serial number can be parsed from this field, it is removed.	o
Amount	10	Character string between two Amount symbols 'a'	a
BankNumber	5	The 4th to 8th characters of the Transit field	
CheckType		If the Auxiliary On-Us field is not present, MICR_CT_PERSONAL If the Auxiliary On-Us field is present, MICR_CT_BUSINESS When no information is available, MICR_CT_UNKNOWN	
CountryCode		If the check type is E-13B: MICR_CC_UNKNOWN If the check type is CMC-7: MICR_CC_CMC7	
EPC	1	When a TransitNumber is present, the number directly preceding the TransitNumber. Spaces are ignored.	a
SerialNumber		If On-Us field is present the data from that field. If not, the data in the On-Us field excluding the Account Number data.	
TransitNumber	9	All characters read between the Transit symbols	t
RawData		All data read in from the MICR	

When desired data cannot be obtained from the data read into the various properties, use the RawData property.

3.3.2 Check Digit

The EPSON OPOS ADK has ability to check the parity of the MICR string with the check's check digit. This functionality is enabled/disabled with the SetupPOS utility. When enabled, the error checking equation as outlined by the American Bankers Association (ABA) is used to check the check's validity whenever a check is successfully read. If all check digits are not successfully read the Check Digit test does not take place.

3.4 Device Statistics

The DeviceStatistics function is added in response to the compliance of the "UPOS 1.8".

Please refer to the "EPSON OPOS ADK MANUAL APPLICATION GUIDE Device Statistics" of a separate volume for the details of the Device Statistics.

3.5 Communication Compatibility

Use the "Communication Compatibility" setting of the SetupPOS utility if you want to enable a compatibility relation to the serial connection in the device being used by the USB connection.

For details, please refer to the "Section 5. SetupPOS Utility" of the "EPSON OPOS ADK MANUAL User's Manual (Installer/ SetupPOS/ TMUSB)" manual.

Section 4. Expanded Functions

This section describes the expanded functions of the MICR device.

4.1 DirectIO Function

The usage of the DirectIO method and DirectIOEvent event is described in the following.

4.1.1 DirectIO Method

Syntax **DirectIO** *Command* As Long, *pData* As Long, *pString* As String

1) MICR_DI_CLEANING

Parameter	Explanation
<i>Command</i>	MICR_DI_CLEANING
<i>pData</i>	Not used.
<i>pString</i>	Not used. Null character string is entered.

Explanation Sends the MICR Cleaning command.

Returned value One of the following is returned and stored in the ResultCode property.

Value	Meaning
OPOS_SUCCESS	DirectIO succeeded.
OPOS_E_CLOSED	The device is closed.
OPOS_E_NOTCLAIMED	The device is not claimed.
OPOS_E_DISABLED	The device is disabled.
OPOS_E_ILLEGAL	Specifies command number without a function.

Requirement Open, Claim & Enable

2) MICR_DI_GETSTATUS

Parameter	Explanation
<i>Command</i>	MICR_DI_GETSTATUS
<i>pData</i>	Not used.
<i>pString</i>	Not used. Null character string is entered.

Explanation Transmits a command that obtains the MICR status. The obtained status is notified by the DirectIOEvent.

Returned value One of the following is returned and stored in the ResultCode property.

Value	Meaning
OPOS_SUCCESS	DirectIO succeeded.
OPOS_E_CLOSED	The device is closed.
OPOS_E_NOTCLAIMED	The device is not claimed.
OPOS_E_DISABLED	The device is disabled.
OPOS_E_ILLEGAL	Specifies command number without a function. The parameter is illegal.

Requirement Open, Claim & Enable

3) MICR_DI_RECOVER_ERROR

Parameter	Explanation
<i>Command</i>	MICR_DI_RECOVER_ERROR
<i>pData</i>	Not used
<i>pString</i>	Not used. Null character string is entered.

Explanation Recover from recoverable error.
When a printer is not in an error mode, the command has no effect on the printer.

Returned value One of the following is returned and stored in the ResultCode property.

Value	Meaning
OPOS_SUCCESS	DirectIO succeeded.
OPOS_E_CLOSED	The device is closed.
OPOS_E_NOTCLAIMED	The device is not claimed.
OPOS_E_DISABLED	The device is disabled.
OPOS_E_ILLEGAL	The parameter is illegal.
Other	Refer to the ResultCode item.

Requirement Open, Claim & Enable

4) MICR_DI_SELECT_CHECK_FONT

Parameter	Explanation
<i>Command</i>	MICR_DI_SELECT_CHECK_FONT
<i>pData</i>	Font constant
<i>pString</i>	Not used. Null character string is entered.

Explanation Changes the font setting of checks to be read.

The assignable values for the pData setting are as follows:

MICR_DI_MICR_CHECK_E13B: Sets the font to E-13B.

MICR_DI_MICR_CHECK_CMC7: Sets the font to CMC7.

This command is valid only in the following device. When the inappropriate device is specified, OPOS_E_ILLEGAL (OPOS_EX_NOTSUPPORTED) is returned.

TM-H6000II

TM-H6000III

TM-H2000

TM-H6000IV

TM-H6000V

Returned value One of the following is returned and stored in the ResultCode property.

Value	Meaning
OPOS_E_CLOSED	The device is closed.
OPOS_E_ILLEGAL	The parameter is illegal.

Requirement Open, Claim & Enable

4.1.2 DirectIOEvent Event

Syntax **DirectIOEvent** *EventNumber* As Long, *pData* As Long, *pString* As String

Parameter	Explanation
<i>EventNumber</i>	Not used.
<i>pData</i>	Single byte data.
<i>pString</i>	Not used.

Remarks This event is fired to send information that results from the running of the DirectIO method. Data is stored in *pData*.

Prerequisites Open, Claim & Enable

4.2 List of Commands Usable with DirectIO

The commands usable with the DirectIO are as follows. Other commands cannot be used

Command	Meaning
DLE EOT BS	Request for real time status
FS c	Clean the MICR hardware

See the product manual for the details of the commands.

Section 5. Device Specific Programming

This section describes device specific programming of the MICR devices.

5.1 Obtaining MICR Status in Real Time

It is possible to obtain the MICR's status by using the MICR's DirectIO method or DirectIOEvent event.

The following is an example program that obtains the MICR status.

```

Global DIEFlag As Long
Global DIEData As Long

Dim RC As Long
Dim Dummy As Long
Dim Data As String

Dummy = 0
Data = ""
DIEFlag = 0

RC = OposMicr1.DirectIO (MICR_DI_GETSTATUS 'Command number
                        Dummy,              'Not used
                        Data)               'Not used

If RC = OPOS_SUCCESS Then
    'Success
Else
    'Error
End If

While( DIEFlag = 0 )
    DoEvents
End While
Status = DIEData

```

[Event management]

```

Private Sub OposMicr1_DirectIOEvent (ByVal EventNumber As Long, pData
As Long, pString As String)
    DIEData = pData
    DIEFlag = 1
End Sub

```

5.2 Cleaning the MICR

The MICR device can be cleaned using the DirectIO method.

A special cleaning sheet is used for cleaning. When this command is executed, please insert the cleaning sheet into the check paper entrance. For detailed information on how to clean the MICR device, please refer to the product manual.

The following is an example program that cleans the MICR:

```

Dim RC As Long
Dim Dummy As Long
Dim Data As String

Dummy = 0
Data = ""
RC = OposMicr1.DirectIO (MICR_DI_CLEANING,      'Command number
                        Dummy,                    'Not used
                        Data)                     'Not used

If RC = OPOS_SUCCESS Then                        'Success
Else
                                                'Error
End If

```

Section 6. Error Information

This section describes the error codes that may result from execution of MICR methods. The common properties and methods are described in "EPSON OPOS ADK MANUAL APPLICATION DEVELOPMENT GUIDE GENERAL DEVELOPMENT". Refer to this guide for more information.

6.1 ResultCode List

6.1.1 When Executing Properties

The ResultCode and ResultCodeExtended when properties are executed are as follows.

Property Name	ResultCode	ResultCodeExtended	Meaning
BinaryConversion	OPOS_SUCCESS	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_CLOSED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_ILLEGAL	OPOS_EX_BADPROPVAL	Set value is illegal.
DeviceEnabled	OPOS_SUCCESS	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_CLOSED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_NOTCLAIMED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_CLAIMED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_NOHARDWARE	0	Refer to <i>UPOS Specifications</i> .
DataEventEnabled	OPOS_SUCCESS	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_CLOSED	0	Refer to <i>UPOS Specifications</i> .
AutoDisabled	OPOS_SUCCESS	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_CLOSED	0	Refer to <i>UPOS Specifications</i> .
FreezeEvent	OPOS_SUCCESS	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_CLOSED	0	Refer to <i>UPOS Specifications</i> .
PowerNotify	OPOS_SUCCESS	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_CLOSED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_ILLEGAL	0	Refer to <i>UPOS Specifications</i> .
		OPOS_EX_INCAPABLE	The function cannot be used.
		OPOS_EX_BADPROPVAL	Set value is illegal.

6.1.2 When A Method is executed

The ResultCode and ResultCodeExtended when methods are executed are as follows.

Method Name	ResultCode	ResultCodeExtended	Meaning
BeginInsertion	OPOS_SUCCESS	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_CLOSED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_NOTCLAIMED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_CLAIMED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_DISABLED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_BUSY	0	Printer power is OFF.
	OPOS_E_ILLEGAL	OPOS_EX_INVALIDMODE	Illegal printer mode.
		OPOS_EX_BADPARAM+1	Data parameter does not comply.
		OPOS_EX_DEVBUSY	Device was busy.
		OPOS_EX_TIMEOUT	Output result is not returned within timeout period.
		OPOS_EX_NOASB	Could not get ASB.
		OPOS_EX_DISPOSE_ERRORREVENT	The event processing is not complete yet.
	OPOS_E_FAILURE	0	Refer to <i>UPOS Specifications</i> .
		OPOS_EX_WAITING_REMOVAL	Check is present still in the device.
		POSPrinter condition errors *1	Refer to <i>UPOS Specifications</i> .
	OPOS_E_TIMEOUT	0	Operation could not be completed within the timeout period.
EndInsertion	OPOS_SUCCESS	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_CLOSED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_NOTCLAIMED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_CLAIMED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_DISABLED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_BUSY	0	Printer power is OFF.
	OPOS_E_FAILURE	0	Refer to <i>UPOS Specifications</i> .
		OPOS_EX_WAITING_REMOVAL	Check is present still in the device.
		POSPrinter condition errors *1	Refer to <i>UPOS Specifications</i> .
	OPOS_E_ILLEGAL	OPOS_EX_INVALIDMODE	Illegal printer mode.
		OPOS_EX_DEVBUSY	Device was busy.
		OPOS_EX_TIMEOUT	Output result is not returned within timeout period.
		OPOS_EX_NOASB	Could not get ASB.
		OPOS_EMICR_NODATA *2	The read data is not check data, or there is no data read.
		OPOS_EMICR_BADSIZE	Too many digits were detected in the check data.
		OPOS_EMICR_BADDATA	The read data contained not analyzable data.
		OPOS_EX_DISPOSE_ERRORREVENT	The event processing is not complete yet.
	OPOS_E_EXTENDED	OPOS_EMICR_NOCHECK	A check is not present in the device.

Method Name	ResultCode	ResultCodeExtended	Meaning
BeginRemoval	OPOS_SUCCESS	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_CLOSED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_NOTCLAIMED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_CLAIMED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_DISABLED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_BUSY	0	Printer power is OFF.
	OPOS_E_OFFLINE	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_TIMEOUT	0	Operation could not be completed within the timeout period.
	OPOS_E_ILLEGAL	OPOS_EX_INVALIDMODE	Illegal printer mode.
		OPOS_EX_BADPARAM+1	Data parameter does not comply.
		OPOS_EX_DEVBUSY	Device was busy.
		OPOS_EX_TIMEOUT	Output result is not returned within timeout period.
		OPOS_EX_NOASB	Could not get ASB.
	OPOS_E_FAILURE	0	Refer to <i>UPOS Specifications</i> .
		OPOS_EX_MICRMODE	The port is locked by the other device.
		POSPrinter condition errors *1	Refer to <i>UPOS Specifications</i> .
EndRemoval	OPOS_SUCCESS	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_CLOSED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_NOTCLAIMED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_CLAIMED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_DISABLED	0	Refer to <i>UPOS Specifications</i> .
	OPOS_E_BUSY	0	Printer power is OFF.
	OPOS_E_FAILURE	OPOS_EPTR_MECHANICAL	Refer to <i>UPOS Specifications</i> .
		OPOS_EPTR_CUTTER	Refer to <i>UPOS Specifications</i> .
		OPOS_EPTR_UNRECOVERABLE	Refer to <i>UPOS Specifications</i> .
		OPOS_EPTR_AUTORECOVERABLE	Refer to <i>UPOS Specifications</i> .
	OPOS_E_ILLEGAL	OPOS_EX_DEVBUSY	Device was busy.
		OPOS_EX_TIMEOUT	Output result is not returned within timeout period.
		OPOS_EX_NOASB	Could not get ASB.
	OPOS_E_EXTENDED	OPOS_EMICR_CHECK	A check is present in the device.

*1 The POSPrinter condition errors are as follows:

- OPOS_EPTR_COVER_OPEN
- OPOS_EPTR_JRN_EMPTY
- OPOS_EPTR_REC_EMPTY
- OPOS_EPTR_REC_CARTRIDGE_REMOVED
- OPOS_EPTR_REC_CARTRIDGE_EMPTY
- OPOS_EPTR_REC_HEAD_CLEANING
- OPOS_EPTR_LABEL_JAM
- OPOS_EPTR_MECHANICAL
- OPOS_EPTR_CUTTER

- OPOS_EPTR_UNRECOVERABLE
- OPOS_EPTR_AUTORECOVERABLE

^{*2} This error is not returned when using the TM-U950.

6.1.3 Error Event

The ResultCode and ResultCodeExtended codes when an error event occurs are as follows.

- Error events to be fired regardless of settings in “Device Specific Setting”.

ResultCode	ResultCodeExtended	Meaning
OPOS_E_FAILURE	OPOS_EMICR_COMPORT	COM port error.
	OPOS_EMICR_DATAEND ^{*1}	Finish of Data Events corresponding to valid data.

^{*1} Unsupported by the TM-U950.

- Error events to be fired when “Issue an Error Event for every error occurrence during Check insertion.” radio button of “Error handling options during Check insertion setting.” in “Device Specific Setting” dialog box is marked.

ResultCode	ResultCodeExtended	Meaning
OPOS_E_EXTENDED	OPOS_EMICR_BADDATA ^{*1}	The read data contained not analyzable data.
	OPOS_EMICR_NODATA ^{*1}	The read data is not check data, or there is no data read.
	OPOS_EMICR_BADSIZE ^{*1}	Too many digits were detected in the check data.
	OPOS_EMICR_JAM ^{*1}	Paper is jammed during reading.
	OPOS_EMICR_CHECKDIGIT	Check of check digits failed.
	OPOS_EMICR_COVEROPEN	Its cover is opened during reading operation.
	OPOS_EMICR_NOCHECK	A check is not present in the device.
OPOS_E_ILLEGAL	OPOS_EX_TIMEOUT	Output result is not returned within timeout period.
OPOS_E_OFFLINE	0	Refer to UPOS Specifications.
OPOS_E_NOHARDWARE	0	Power is OFF or unconnected.

^{*1} Unsupported by the TM-U950.

- Error events to be fired when “Issue an Error Event for every error occurrence during Check insertion.” radio button of “Error handling options during Check insertion setting.” in “Device Specific Setting” dialog box is marked.

ResultCode	ResultCodeExtended	Meaning
OPOS_E_ILLEGAL	OPOS_EMICR_DATAERROR ^{*1}	The read data contained not analyzable data.
	OPOS_EMICR_DIGITERROR ^{*2}	Data format is illegal. (Check of check digits failed.)

^{*1} Unsupported by the TM-U950.

^{*2} Error event to be fired when “Fire ErrorEvent on check digit parity error.” check box in “Device Specific Setting” dialog box is marked.

6.2 Remedial Actions for Principal Errors

ResultCodeExtended	Remedy
OPOS_EX_DEVBUSY OPOS_EX_TIMEOUT	If the power to the MICR(TM Printer) is disconnected, it is necessary to once apply Close and then invoke Open/Claim/Enable again.
OPOS_EPTR_COVER_OPEN OPOS_EPTR_JRN(REC)_EMPTY OPOS_EPTR_CUTTER OPOS_EPTR_UNRECOVERABLE OPOS_EPTR_AUTORECOVERABLE OPOS_EPTR_MECHANICAL OPOS_EMICR_COVEROPEN OPOS_EMICR_JAM OPOS_EPTR_REC_CARTRIDGE_REMOVED OPOS_EPTR_REC_CARTRIDGE_EMPTY OPOS_EPTR_REC_HEAD_CLEANING	Confirm the status of the printer, and then execute the program and method again.
OPOS_EX_INVALIDMODE	Establish the condition where processing can be executed, and execute again.
OPOS_EX_BADPARAM + x	The parameter is not correct for the method to be used. Confirm the parameter range for the method to be used.
OPOS_EMICR_NOCHECK OPOS_EMICR_CHECK	A Check is inserted/removed incorrectly. Confirm the check is inserted/removed correctly.
OPOS_EMICR_BADDATA OPOS_EMICR_DATAERROR OPOS_EMICR_BADSIZE OPOS_EMICR_NODATA	Check data error. Once remove it, then insert again, or use a proper check.
OPOS_EX_DISPOSE_ERROREVENT	The event processing is not complete yet. Execute the event processing.

Section 7. Warnings

- All EPSON TM series MICR settings follow the same hydra connection settings as the master device EPSON TM series printer. Please read the Section 7 of "EPSON OPOS ADK MANUAL/APPLICATION DEVELOPMENT GUIDE/ POSPrinter (TM Series)" for further information.
- Do not set the input and output buffers below the minimum 32 bytes.
- The EPSON TM series MICR's EndInsertion method readies the printer to receive a check and sets the printing position. This setting may take a time. During this time, all devices connected by hydra settings are frozen. (For example, the display marquee stops.)
- During MICR mode (waiting receive a Check), using the Claim method on any hydra devices (except the CashDrawer) will return an error.
- When "Issue an Error Event for specified error occurrence during Check insertion." radio button of "Error handling options during Check insertion setting." in "Device Specific Setting" dialog box is marked, its operation is the same as the previous versions of Ver. 2.30.
The to be set values of ResultCodeExtended property, namely, 'OPOS_EMICR_BADSIZE' and 'OPOS_EMICR_NODATA' are not compatible with versions used prior to Ver. 2.30. In this case, the values defined in UPOS Release 1.7 and subsequent releases are set.
- When Ver. 2.30 overwrites a previous version, settings at "Error handling options during Check insertion setting" are reset to "Issue an Error Event for every error occurrence during Check insertion". If you wish to operate with a previous version, resetting is required.
The setting items other than above, namely, "Automatic check remove on read error", "Fire ErrorEvent on check digit parity error" and "Check font" are succeeding the settings of the previous version.
- ResultCodeExtended property values of printers and MICRs are sometimes the same. However, please pay attention to the meaning of the error since the meaning differs by combinations of ResultCode and ResultCodeExtended.
- The error code differs by that timing when the power is turned OFF.

Section 8. Appendix

8.1 Changes for Corresponding UPOS Release 1.7

In this section, changes regarding MICR operation, ResultCode and ResultCodeExtended properties that corresponds UPOS Release 1.7 are explained.

8.1.1 Return Values

Error codes are modified for corresponding “UPOS Release 1.7”.

Operation differences by settings of device specific are as follows.

Error	ResultCodeExtended Values for the Previous Versions of Ver. 2.30	ResultCodeExtended Values for Ver. 2.30
A part of the data is not analyzable	OPOS_EMICR_DATAERROR (70002)	OPOS_EMICR_BADDATA (203) OPOS_EMICR_DATAERROR (70002) *1
There is no data to be read	OPOS_EMICR_NODATA (70006)	OPOS_EMICR_NODATA (204)
The check read is longer than prescribed length	OPOS_EMICR_BADSIZE (70005)	OPOS_EMICR_BADSIZE (205)
The data format is illegal	OPOS_EMICR_DIGITERROR (70007)	OPOS_EMICR_CHECKDIGIT (207) Or OPOS_EMICR_DIGITERROR (70007) *1

*1 By marking “Issue an Error Event for specified error occurrence during Check insertion.” radio button of “Error handling options during Check insertion setting.” in “Device Specific Settings” dialog box, the errors are notified by error events.

8.1.2 MICR Operations by Specific Settings of Devices

Based on the setting of “Error handling options during Check insertion setting.” in “Device Specific Settings” dialog box, operations, firing error events and return value differ considerably.

The differences by the settings of device specifications are indicated in the following table.

(A) and (B) in the following table indicate:

(A)··· [Issue an Error Event for every error occurrence during Check insertion.]

(B)··· [Issue an Error Event for specified error occurrence during Check insertion.]

Operation Difference		
	(A) is marked	(B) is marked
The read data is normal	<p>Upon completion of EndInsertion method, the following return values are set: RC: OPOS_SUCCESS RCE: 0</p> <p>The result of data analysis is notified by DataEvent. DataEvent status is “0”</p>	<p>Upon completion of EndInsertion method, the following return values are set: RC: OPOS_SUCCESS RCE: 0</p> <p>The result of data analysis is notified by DataEvent. DataEvent status is “0”</p>
There is no data to read	<p>Upon completion of EndInsertion method, the following return values are set: RC: OPOS_SUCCESS RCE: 0</p> <p>The result of data analysis is notified by ErrorEvent. RC and RCE of the ErrorEvent are as follows: RC: OPOS_E_EXTENDED RCE: OPOS_EMICR_NODATA</p>	<p>Upon completion of EndInsertion method, the following return values are set: RC: OPOS_E_ILLEGAL RCE: OPOS_EMICR_NODATA</p> <p>There is no notification by event.</p>
Paper length is illegal	<p>Upon completion of EndInsertion method, the following return values are set: RC: OPOS_SUCCESS RCE: 0</p> <p>The result of data analysis is notified by ErrorEvent. RC and RCE of the ErrorEvent are as follows: RC: OPOS_E_EXTENDED RCE: OPOS_EMICR_BADSIZE</p>	<p>Upon completion of EndInsertion method, the following return values are set: RC: OPOS_E_ILLEGAL RCE: OPOS_EMICR_BADSIZE</p> <p>There is no notification by event.</p>

The data format is illegal	<p>Upon completion of EndInsertion method, the following retune values are set: RC: OPOS_SUCCESS RCE: 0</p> <p>The result of data analysis is notified by ErrorEvent. RC and RCE of the ErrorEvent are as follows: RC: OPOS_E_EXTENDED RCE: OPOS_EMICR_CHECKDIGIT</p>	<p>Upon completion of EndInsertion method, the following retune values are set: RC: OPOS_SUCCESS RCE: 0</p> <p>When “Fire ErrorEvent on check digit parity error” check box in “Device Specific Setting” dialog is marked, the result of data analysis is notified by ErrorEvent. RC and RCE of the ErrorEvent are as follows: RC: OPOS_E_ILLEGAL RCE: OPOS_EMICR_DIGITERROR</p>
A part of the data is not analyzable Or Noise error is occurred	<p>Upon completion of EndInsertion method, the following retune values are set: RC: OPOS_SUCCESS RCE: 0</p> <p>The result of data analysis is notified by ErrorEvent. RC and RCE of the ErrorEvent are as follows: RC: OPOS_E_EXTENDED RCE: OPOS_EMICR_BADDATA</p>	<p>Upon completion of EndInsertion method, the following retune values are set: RC: OPOS_E_ILLEGAL RCE: OPOS_EMICR_BADDATA</p> <p>The result of data analysis is notified by ErrorEvent. RC and RCE of the ErrorEvent are as follows: RC: OPOS_E_ILLEGAL RCE: OPOS_EMICR_DATAERROR</p>
The cover is opened during insertion	<p>Upon completion of EndInsertion method, the following retune values are set: RC: OPOS_SUCCESS RCE: 0</p> <p>The result of data analysis is notified by ErrorEvent. RC and RCE of the ErrorEvent are as follows: RC: OPOS_E_EXTENDED RCE: OPOS_EMICR_COVEROPEN</p>	<p>Upon completion of EndInsertion method, the following retune values are set: RC: OPOS_E_OFFLINE RCE: 0</p> <p>There is no notification by event.</p>
The paper is jammed during insertion	<p>Upon completion of EndInsertion method, the following retune values are set: RC: OPOS_SUCCESS RCE: 0</p> <p>The result of data analysis is notified by ErrorEvent. RC and RCE of the ErrorEvent are as follows: RC: OPOS_E_EXTENDED RCE: OPOS_EMICR_JAM</p>	<p>Upon completion of EndInsertion method, the following retune values are set: RC: OPOS_E_OFFLINE RCE: 0</p> <p>There is no notification by event.</p>

The power is turned off during insertion	<p>Upon completion of EndInsertion method, the following retune values are set: RC: OPOS_SUCCESS RCE: 0</p> <p>The result of data analysis is notified by ErrorEvent. RC and RCE of the ErrorEvent are as follows: When power OFF state is detectable RC: OPOS_EX_NOHARDWARE RCE: 0</p> <p>When power OFF state is not detectable RC: OPOS_E_OFFLINE RCE: 0</p>	<p>Upon completion of EndInsertion method, the following retune values are set:</p> <p>When power OFF state is detectable RC: OPOS_E_ILLEGAL RCE: OPOS_EX_BUSY</p> <p>When power OFF state is not detectable RC: OPOS_E_OFFLINE RCE: 0</p> <p>There is no notification by event.</p>
The paper is removed during insertion	<p>Upon completion of EndInsertion method, the following retune values are set: RC: OPOS_SUCCESS RCE: 0</p> <p>The result of data analysis is notified by ErrorEvent. RC and RCE of the ErrorEvent are as follows: RC: OPOS_E_EXTENDED RCE: OPOS_EMICR_NOCHECK</p>	<p>Upon completion of EndInsertion method, the following retune values are set: RC: OPOS_E_EXTENDED RCE: OPOS_EMICR_NOCHECK</p> <p>There is no notification by event.</p>
The line is turned off during insertion	<p>Upon completion of EndInsertion method, the following retune values are set: RC: OPOS_SUCCESS RCE: 0</p> <p>The result of data analysis is notified by ErrorEvent. RC and RCE of the ErrorEvent are as follows: RC: OPOS_E_OFFLINE RCE: 0</p>	<p>Upon completion of EndInsertion method, the following retune values are set: RC: OPOS_E_OFFLINE RCE: 0</p> <p>There is no notification by event.</p>
The timeout time is up	<p>Upon completion of EndInsertion method, the following retune values are set: RC: OPOS_SUCCESS RCE: 0</p> <p>The result of data analysis is notified by ErrorEvent. RC and RCE of the ErrorEvent are as follows: RC: OPOS_E_ILLEGAL; RCE: OPOS_EX_TIMEOUT</p>	<p>Upon completion of EndInsertion method, the following retune values are set: RC: OPOS_E_ILLEGAL; RCE: OPOS_EX_TIMEOUT</p> <p>There is no notification by event.</p>