EPSON OPOS ADK for .NET Manual

Application Development Guide

MICR
(TM-U950)

Version 1.14.6 Dec. 2017

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Chapter 1 Introduction

This section explains how to use MICR when using EPSON OPOS ADK for .NET, including any related information and special notes regarding the device.

For details on the POS for .NET API, refer to the "UnifiedPOS Retail Peripheral Architecture Version 1.14.1" specification and the MSDN "POS for .NET v1.14.1 SDK Documentation":
> http://www.omg.org/retail/unified-pos.htm
> https://msdn.microsoft.com/en-us/library/bb429024(v=winembedded.4).aspx

1.1 Terminology

- "UnifiedPOS Retail Peripheral Architecture Version 1.14.1" may be abbreviated as "UPOS".
- "Microsoft POS for .NET" may be abbreviated as "POS.NET".
- "EPSON OPOS ADK for .NET Version 1.14.6" may be abbreviated as "OPOS.NET".
- "MICR" may be abbreviated as "the device".
- "The ServiceObject of MICR provided by OPOS.NET" may be abbreviated as "ServiceObject".
- "ErrorCode property of PosControlException" may be abbreviated as "ErrorCode".
- "ErrorCodeExtended property of PosControlException" may be abbreviated as "ErrorCodeExtended".
- "Exception" indicates "PosControlException".
- The EPSON original device constant used with this device is defined in "jp.co.epson.uposcommon.EpsonUPOSConst" and "jp.co.epson.uposcommon.EpsonMICRConst".
- When used at the same time as POSPrinter, cut paper may be inserted. In this case, read "check" in this manual as "cut paper" as necessary.
- Wired LANs and wireless LANs may be referred to as networks.

Chapter 2 Before Using MICR

This chapter explains how to set up MICR, as well as notes and restrictions on using it.

2.1 Device Setting

After checking the hardware model number and the hardware settings, select the correct device using the SetupPOS utility. Refer to "Appendix C Hardware Settings" information on setting the hardware. Refer to "Appendix B SetupPOS Settings" information on how to use the SetupPOS utility.

2.2 Notes and Restrictions

- While the **EndInsertion** method is executed, there may be notification from **DataEvent** and **ErrorEvent**.
- With the **EndInsertion** method, image data scanning is performed. During this time, output is not possible to devices connected to the printer other than MICR (Example: The LineDisplay marquee stops).
- In the **EndInsertion** method, the setting of printing position is carried out after reading the check.
- ServiceObject does not carry out data analysis for CMC7 check.
- When rebooting the device, wait for at least 5 second after turning OFF the power before powering up again.
- If the device power is rebooted, execute the **Release** method once.
- When the check is inserted in the device, if the cover is opened and closed, the check is not ejected.

Chapter 3 Properties, Methods, and Events

3.1 Properties

The properties that differ from functions described in UPOS are shown below.

3.1.1 CapPowerReporting property

Description

The notification capability of the connected device is identified.

This property is set to one of the following values.

Value	Meaning
PowerReporting.Standard	The value set when there is a serial connection. ServiceObject can determine between and provide notification of the two power statuses: OFF_OFFLINE (the device is turned off or offline) and ONLINE.

3.1.2 CountryCode property

Description

It is set with data showing the issuing country of the check that had just been read out by MICR.

In this ServiceObject, only the following values are set:

Value	Meaning
CheckCountryCode.Unknown	The country name is unknown.

3.1.3 DeviceEnabled property

Description

When the Device Enabled property is set to TRUE first after the Claim method is executed, device initialization is performed.

In the following states, device initialization cannot be done:
- Offline (e.g. Cover open, out of paper, etc.)
- Error (e.g. Paper jam)

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When the Device Enabled property is set to TRUE, the printer state is notified via a StatusUpdateEvent.

If the StatusUpdateEvent for the printer stat is not defined in UPOS, however, the StatusUpdateEvent cannot be notified. In this case, the printer status can be found by examining the exception that is notified when the method is executed.

If the device initialization cannot be done when the Device Enabled property is set to TRUE, a device status is checked at an interval of 1 second, and it is repeated until the device initialization is performed completely.

The device initialization status can be found by enabling the Power Notify property.

When StatusPowerOnline is notified by a StatusUpdateEvent, the initialization process is complete.

In addition, the initialization process may take several seconds depending on the connection speed and the image registration status.

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3.2 Method

The methods that differ from functions described in UPOS are shown below.

3.2.1 Claim method

Description

The device connection state is confirmed. If the device is not connected, or if the power is OFF, an exception is thrown. In the case of a Serial connection, the device connection state cannot be confirmed. In this case, Success is always returned.

3.2.2 CheckHealth method

Description

This ServiceObject supports only "HealthCheckLevel.Interactive".

When "HealthCheckLevel.Interactive" is executed, the following dialog box appears.
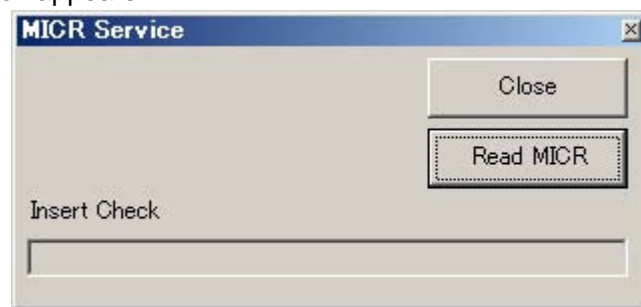
When buttons are clicked, the operations are as follows:

- **"Read MICR" button**

Clicking Read MICR enables CheckHealth to enter the check insertion waiting mode. When a check is inserted, it is scanned and ejected, and the **RawData** property is displayed to "InsertCheck". If a scanning error occurs, a message indicating the type of error is displayed.

- **"Close" button**

Clicking Close ends **CheckHealth** method.

The results are saved in the **CheckHealthText** property.

And besides, the following value is retrieved as the returned value of method.

Value	Meaning
Interactive HCheck：Canceled	Ended CheckHealth without scanning a single check.
Interactive HCheck：Complete	Ended CheckHealth after scanning the last check ended normally.
Interactive HCheck：Error - <*Message*>	Ended CheckHealth after scanning the last check ended with an error. The content of the error appears as a *Message*.

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3.2.3 DirectIO method

Description

> **DirectIO** method can be used when the **DeviceEnabled** property is "true".
>
> The functions that the **DirectIO** method supports are as follows.

Command	Outline of function
MICR_DI_CLEANING	Cleaning of MICR is executed.

● **MICR_DI_CLEANING command**

Parameter

command	MICR_DI_CLEANING
data	Unused
object(byte[] type)	Unused

Description

> It cleans the MICR device.
>
> When this command is executed, the cleaning sheet is taken up from the check insertion slot and cleaning process is carried out. After this, the sheet is ejected.

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3.2.4 ResetStatistics Method

- **Parameter type: *Microsoft.PointOfService.StatisticCategories***

  Parameter

  Microsoft.PointOfService.StatisticCategories

  Specify one of the following.
  - StatisticCategories.Upos
  - StatisticCategories.Manufacturer
  - StatisticCategories.All

  Description

  Of the items included in the specified category, only the items for which O appeared for the permission reset in "Appendix-E DeviceStatistics" are reset.

  All the statistics supported by the ServiceObject are defined in UPOS. If "StatisticCategories.Manufacturer" is specified, nothing is reset.

- **Parameter type: *String[]***

  Parameter

  String[]   An array of the item names to reset

  Description

  Of the items included in the specified category, only the items for which O appears for the reset permission in "Appendix-E DeviceStatistics" are reset when "U_", "M_", or an empty string is specified for item names.

  If an illegal item name or non-resettable item name is included, this method reports an error. When this happens, correctly specified items are also not reset.

  All the statistics supported by the ServiceObject are defined in UPOS. If "M_" is specified, nothing is reset.

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3.2.5 ResetStatistic Method

Description

Of the items included in the specified category, only the items for which O appears for the reset permission in "Appendix-E DeviceStatistics" are reset when "U_", "M_", or an empty string is specified for item names.

If an illegal item name or non-resettable item name is specified, this method reports an error.

All the statistics supported by the ServiceObject are defined in UPOS. If "M_" is specified, nothing is reset.

3.2.6 RetrieveStatistics Method

● **Parameter type: *Microsoft.PointOfService.StatisticCategories***

Parameter
_____

Microsoft.PointOfService.StatisticCategories

Specify one of the following.

- StatisticCategories.Upos
- StatisticCategories.Manufacturer
- StatisticCategories.All

Description

The Statistics supported by ServiceObject are all defined in UPOS. If "StatisticCategories.Manufacturer" is specified, the minimum information specified by UPOS (the 4 items; UPOS version, manufacturer name, device name, and device category) is acquired.

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- **Parameter type: *String[]***

Parameter

String[]   An array of the item names to retrieve

Description

If an illegal item name is included, this method reports an error.

The Statistics supported by ServiceObject are all defined in UPOS. If "M_" is specified, the minimum information specified by UPOS (the 4 items; UPOS version, manufacturer name, device name, and device category) is acquired.

- **Parameter type: None**
Description

The information of all defined items is retrieved.

3.2.7 RetrieveStatistic Method

Description

If an illegal item name is included, this method reports an error.

If multiple item names separated by commas are specified (UPOS Specification), an error is reported.

The Statistics supported by ServiceObject are all defined in UPOS. If "M_" is specified, the minimum information specified by UPOS (the 4 items; UPOS version, manufacturer name, device name, and device category) is acquired.

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3.2.8 UpdateStatistics Method

● **Parameter type: *Microsoft.PointOfService.Statistic[]***

Parameter
Microsoft.PointOfService.Statistic[] Specifies *Microsoft.PointOfService.Statistic* array for which item names and new values have been set.

Description

Of the items included in the specified category, only the items for which O appears for the update permission in "Appendix-E DeviceStatistics" are updated when "U_", "M_", or an empty string is specified for item names. If an illegal item name or non-updatable item name is included, this method reports an error. In this case, correctly specified items are also not updated.

The Statistics supported by ServiceObject are all defined by UPOS. If "M_" is specified, nothing is updated.

● **Parameter type:** *Microsoft.PointOfService.StatisticCategories*

Parameter

Microsoft.PointOfService.StatisticCategories

> Specify one of the following.
> - StatisticCategories.Upos
> - StatisticCategories.Manufacturer
> - StatisticCategories.All

Object　　　　Specify the new value after updating.

Description

Of the items included in the specified category, only the items for which O appeared for the update permission in "Appendix-E DeviceStatistics" are updated.

All the statistics supported by the ServiceObject are defined in UPOS. If "StatisticCategories.Manufacturer" is specified, nothing is update.

3.2.9 UpdateStatistic Method

Description

Of the items included in the specified category, only the items for which O appears for the update permission in "Appendix-E DeviceStatistics" are updated when "U_", "M_", or an empty string is specified for item names. If an illegal item name or non-updatable item name is specified, this method reports an error.

The Statistics supported by ServiceObject are all defined by UPOS. If "M_" is specified, nothing is updated.

3.2.10 BeginInsertion method

Description

The **BeginInsertion** method determines whether a check is placed on the clamp.

The device supported by the ServiceObject cannot open the clamp or change to the check insertion mode.

3.2.11 EndInsertion method

Description

If check is placed in the insertion slot of device, the check is taken up and analysis carried out.

If there is no check, an exception is thrown.

3.2.12 BeginRemoval method

Description

When this method is executed, the check is ejected.

The device waits until the check is removed from the device completely.

If the check is not ejected completely from the device when the time of the *timeout* parameter has elapsed, an exception with the "ErrorCode.Timeout" ErrorCode is thrown.

3.2.13 EndRemoval method

Description

When this method is executed, the device checks whether or not there is a check in the ejection slot.

If there is a check in the insertion slot or ejection slot of the printer, an exception is thrown.

3.2.14 ClearInputProperties method

Description

The following properties are cleared by this method:

Property Name	Cleared Value
AccountNumber Property	"" (empty character string)
Amount Property	"" (empty character string)
BankNumber Property	"" (empty character string)

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CheckType Property	99 ("Unknown type")
CountryCode Property	99 ("Unknown code")
EPC Property	"" (empty character string)
RawData Property	"" (empty character string)
SerialNumber Property	"" (empty character string)
TransitNumber Property	"" (empty character string)

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3.3 Events

3.3.1 ErrorEvent event

Description

In this ServiceObject, each property related to MICR data is updated immediately prior to the ErrorLocus value issuing the ErrorEvent set in "ErrorLocus.Input".

The properties that are updated and the updated value obtained are as follows:

Property Name	Value
AccountNumber	"" (empty character string)
Amount	"" (empty character string)
BankNumber	"" (empty character string)
EPC	"" (empty character string)
RawData	MICR data that was read or "" (empty character string)
SerialNumber	"" (empty character string)
TransitNumber	"" (empty character string)
CheckType	CheckType.Unknown
CountryCode	CheckCountryCode.Unknown

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Appendix A Revision history

A.1 EPSON OPOS ADK for .NET 1.14.6

(1) Microsoft POS for .NET 1.14.1 is supported.

A.2 EPSON OPOS ADK for .NET 1.11

(1) Microsoft POS for .NET 1.11 is supported.

(2) Changed Error codes for Hydra Devices.

(3) Changed initialization sequence.

A.3 EPSON OPOS ADK for .NET 1.9

(1) Microsoft POS for .NET 1.1 is supported.

A.4 EPSON OPOS ADK for .NET 1.8

POS Device driver complied with Microsoft POS for .NET 1.0 specification has been provided.

This version has been created based on EPSON OPOS ADK 2.40.

The following shows the difference between this version and EPSON OPOS ADK 2.40.

Differences from EPSON OPOS ADK 2.40

(1) The **ErrorCode** and **ErrorCodeExtended** for exceptions have all been reviewed.

(2) **DeviceEnabled** property status has been deleted from the issuing conditions of queued events. As a result, even when the status of the **DeviceEnabled** property is "false", there may be notification of events.

(3) The **Open** method has been changed so that when it is executed, a communication control class instance is generated. If a communication control class instance is not generated, when the **Open** method is executed, an exception is thrown.

(4) The judgment of error during the execution of **EndInsertion** has been reviewed, and handling has been changed to give priority to the results of reading from device. As a result, even if device is in error state (such as cover is open)

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during reading, there may be cases where data can be read correctly.

(5) If **State** property is ControlState.Error, **BeginInsertion** method and **EndInsertion** method cannot be executed.

(6) The issuance method of events when read error occurs has been changed. Property is changed if ErrorLocus issues **ErrorEvent** set in "ErrorLocus.Input".

(7) UPOS1.9 is supported.

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Appendix B SetupPOS Settings

B.1 "Verify Check Digit" check box

Description

Sets for availability of CheckDigit verification function.

Condition	Meaning
Checked	CheckDigit is verified
Not checked	CheckDigit is not verified

- **If verification of CheckDigit is set**

    If error is judged in the verification of CheckDigit, notification is made as an ErrorEvent.

Default: checked

B.2 "MICR Character Type" combo box

Description

Sets the data format of the check to be read.

Item	Meaning
E13B	The check is in E13B format
CMC7	The check is in CMC7 format

If set to "CMC7", the data read from the check is not analyzed.

Default: E13B

B.3 "Slip Clamp Time (ms)" text box

Description

Set the time from insertion of single sheet (execution of the **EndInsertion** method) until clamping.

Setting Value	Meaning
0 to 6400	Waiting time until clamping (unit: ms)
	Setting can be done in units of 100 ms

Default: 0 (ms)

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Appendix C Hardware Settings

C.1 DIP switch settings

Set the DIP switches of this device as follows:

1) Serial interface

DIP-SW1

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

DIP-SW2

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

Note 1   Numbers 2 and 3 of DIP-SW1 set the parity.

DIP Switch 1 Parity Settings

SW No.	Function	ON	OFF	Default
1-2	Parity check	Parity	No parity	OFF
1-3	Parity selection	Even parity	Odd parity	OFF

Note 2   Numbers 4 and 5 of DIP-SW1 set the communication speed.

DIP Switch 1 Transmission Speed Switching

SW1-4	SW1-5	Baud Rate (bps)
ON	ON	1200
OFF	ON	2400
ON	OFF	4800
OFF	OFF	9600

Note 3   Number 6 of DIP-SW1 sets the connection type of LineDisplay.

Note 4   Numbers 7 and 8 of DIP-SW2 set the reset signal.

C.2 Memory switch settings

This device does not have memory switches.

Appendix D Default Values of Properties

The default values of the properties of this device are shown below.

Property Name	Default value	Acceptable Setting Values
AutoDisable	false	true false
CapCompareFirmwareVersion	false	-
CapPowerReporting	PowerReporting.Standard	-
CapStatisticsReporting	true	-
CapUpdateFirmware	false	-
CapUpdateStatistics	true	-
CheckHealthText	""	-
Claimed	false	-
DataCount	0	-
DataEventEnabled	false	true false
DeviceDescription	EPSON TM-U950 MICR	-
DeviceEnabled	false	true false
DeviceName	TM-U950	-
FreezeEvents	false	true false
PowerNotify	PowerNotification.Disabled	PowerNotification.Disabled PowerNotification.Enabled
PowerState	PowerState.Unknown	-
State	ControlState.Closed	-
CapValidationDevice	true	-
AccountNumber	""	-
Amount	""	-
BankNumber	""	-
EPC	""	-
RawData	""	-
SerialNumber	""	-
TransitNumber	""	-
CheckType	CheckType.Unknown	-
CountryCode	CheckCountryCode.Unknown	-

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Appendix E DeviceStatistics

The Statistics function list of this device is shown below.

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XML Definition Name	Description	Reset Permission	Update Permission
UnifiedPOSVersion	UPOS version	×	×
DeviceCategory	Device category	×	×
ManufactureName	Manufacturer name	×	×
ModelName	Device name	×	×
SerialNumber	Serial number	×	×
ManufactureDate	Manufacture date	×	×
MechanicalRevision	Device revision	×	×
FirmwareRevision	Firmware version	×	×
Interface	Interface	×	×
InstallationDate	Installation date	×	×
HoursPoweredCount	Operation time	O	O
CommunicationErrorCount	Communication error count	O	O
GoodReadCount	Number of successful MICR data	O	O
FailedDataParseCount	Number of failed MICR data analisys	O	O
FailedReadCount	Number of failed MICR data	O	O

O:Permitted
× :Not permitted

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