TOSHIBA

Windows POS Terminal

TEC OPOS Control

USB Keylock OPOS Application Programmer's Guide for PKBST

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1. Overview

This specification describes the matters that require attention and the methods Application Programming to utilize TEC OPOS Control.

It is assumed that the reader already possesses some knowledge of:

- .... General features of the POS peripherals.
- .... General features of TEC POS Terminal and TEC POS peripherals.
- .... Terms and Architecture for the OLE Control and Automation.
- .... The OLE for Retail POS (abbr. OPOS) and the Application Programmer's Guide.

2. Keylock

1.1 USB PKBST Keylock Control ["PKBSTUB"]

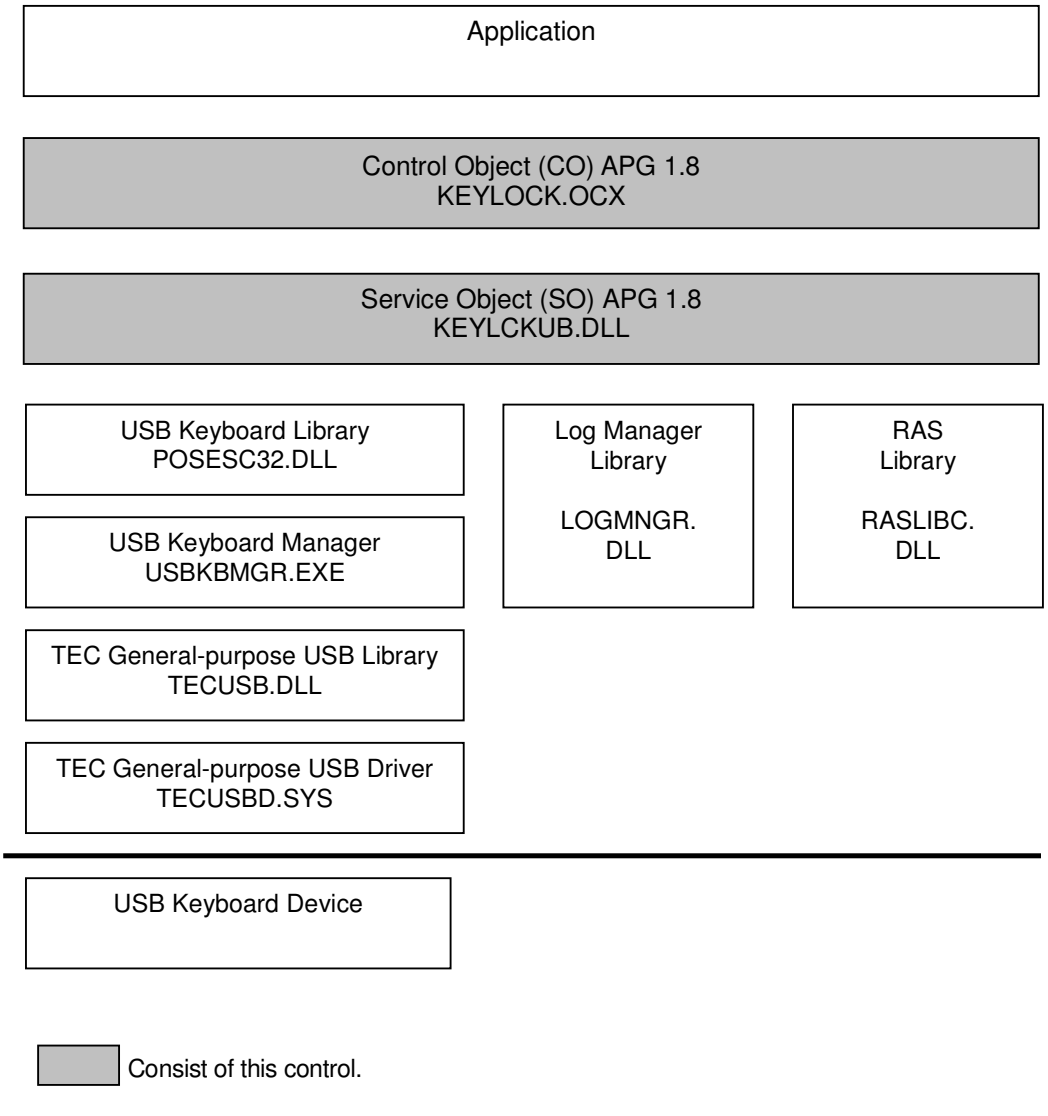
2.1.1 Applicable Models and Operating Systems

Model	Interface	Device Name (*1)
PKBST-52 (USB) Keylock	USB I/F	"PKBSTUB"
Operating System		
Windows XP Professional Windows Embedded for Point of Service (WEPOS) Windows Embedded POSReady 2009 Windows 7 Professional Windows Embedded 7		

(*1) Device names are used by the Open method.

2.1.2 Software Structure

The software structure of the USB PKBST Keylock Control is as shown below.



2.1.3 Functions

Functions supported	Functions not supported
Power notification	Collection of statistics Reset of statistics Change of statistics

USB PKBST Keylock Control – Functions

The following table shows only the device-dependent properties.

Common property	Value
ControlObjectDescription	"TEC OPOS Keylock Control Object"
ControlObjectVersion	"1008000"
ServiceObjectDescription	"TEC OPOS USB Keylock Service Object"
ServiceObjectVersion	"1008000"
DeviceDescription	"TEC Keylock on PKBST-5x USB POS Keyboard"
DeviceName	"PKBSTUB"
CapPowerReporting	OPOS_PR_STANDARD
CapStatisticsReporting	FALSE
CapUpdateStatistics	FALSE
Exclusive property	**Value**
PositionCount	9

USB PKBST Keylock Control – Property Values (in part)

2.1.4 CheckHealth Method Specifications

1) Internal Level (OPOS_CH_INTERNAL)

Return value (ResultCode)	CheckHealthText	Meaning
OPOS_E_ILLEGAL	"Internal Hcheck:Illegal"	Not supported.

2) External Level (OPOS_CH_EXTERNAL)

Outputs the key lock enable command and determines according to the result of the command.

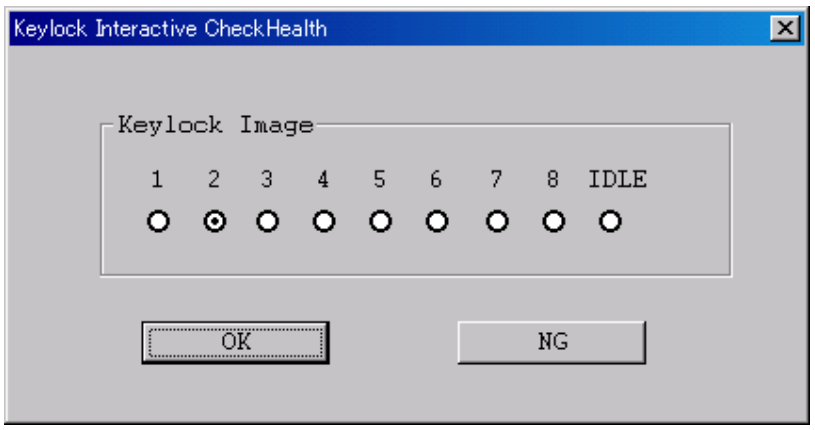
Return value (ResultCode)	CheckHealthText	Meaning
OPOS_SUCCESS	"External HCheck: Successful"	The key lock data succeeded.
OPOS_E_FAILURE	"External HCheck: Data Error"	The key lock data failed.
OPOS_E_NOHARDWARE	"External Hcheck: Not Support"	Not supported.
OPOS_E_BUSY	"External HCheck: Busy"	Device is busy.
OPOS_E_DISABLED	"HCheck: Not Enabled"	Disabled

3) Interactive Level (OPOS_CH_INTERACTIVE)

Displays the following dialog box.

Check that the corresponding radio button is selected correctly each time the key lock position is changed. Click on the [OK] button when a visual check confirms the key lock positions are properly displayed, and click on the [NG] button when not.

Note that the numbers displayed on the dialog box and the values set for the KeyPosition property do not match.



Return value (ResultCode)	CheckHealthText	Meaning
OPOS_SUCCESS	"Interactive Hcheck: Successful"	Completed with the "OK" button.
OPOS_E_FAILURE	"Interactive Hcheck: Error"	Completed with the "NG" button.
OPOS_E_DISABLED	"HCheck: Not Enabled"	Disable state

Note: Close all other applications before executing CheckHealth because the keylock generates an event for all applications being opened.

2.1.5 DirectIO Specifications

This Control supports no functions using the DirectIO method.

2.1.6 OPOS Registry

The Keylock control contains the following configuration information:

HKEY_LOCAL_MACHINE\SOFTWARE\OLEforRetail\ServiceOPOS\Keylock\PKBSTUB

General	"TEC.USBKeylock1"
Service	"C:\OPOS\TEC\KEYLCKUB.dll"
Description	"TEC Keylock on PKBST-5x USB POS Keyboard"
Version	"1.8"
KeyPosition	""
ResponseTimeout	""
ResponseRetryCount	
DebugLogLevel	"0" | "1" | "2"
DebugLogFile	"C:\OPOS\TEC\LOG\PKBSTUB.LOG"

Service	File name of Service Object
Description	Brief explanation of Service Object
Version	Version number of Service Object
KeyPosition	Specifies the method of mapping between the key positions unique to the device and the KeyPosition values of OPOS. Comma-delimited 9 numbers shows the mapping: The place of the number indicates the key position on the device, and each number indicates the KeyPosition value. For example, "1,2,3,4,5,6,7,8,9" means that the KeyPosition values are assigned to the key positions of the same numbers.When the key position mapping is omitted, "1,2,4,5,6,7,8,3,9" is specified. The standard mapping is as follows. Key position on the device KeyPosition value 4 LOCK_KP_LOCK(1) 3 LOCK_KP_NORM(2) 2 LOCK_KP_SUPR+1(4) 1 LOCK_KP_SUPR+2(5) 8 LOCK_KP_SUPR+3(6) 7 LOCK_KP_SUPR+4(7) 5 LOCK_KP_SUPR+5(8) 6 LOCK_KP_SUPR(3) 9 LOCK_KP_SUPR+6(9)
ResponseTimeout	Specifies the monitoring time from the key position detection is started until the key position is actually detected. The unit of measure is msec. If the key position cannot be detected within the specified time, the status of the DeviceEnabled property changes from TRUE to OPOS_E_BUSY. When the setting is omitted, "5000" will be set.
ResponseRetryCount	Specifies the number of times the key position detection is retried after the timeout specified by the ResponseTimeout in case the detection failed. When the setting is omitted, no retry will be performed.
DebugLogLevel	Specifies the extent of the log data to be output. There are 3 options: "0" The log is not output. "1" Basic log is output. "2" Detailed log is output.

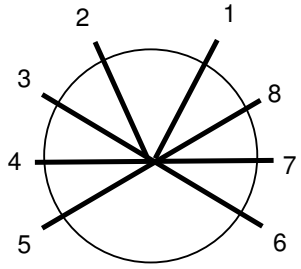
DebugLogFile	Specifies the full pathname of the file where the log is written. Even if the specified directory is not found, it will not be created automatically.

USB PKBST Keylock Control Registries

2.1.7 Limitations and Precautions

1) Relation between the KeyPosition property and the device
Physically, there are nine key lock positions, and the KeyPosition properties are assigned to these key positions as follows. (The constants used for the KeyPosition property are same as those used for the WaitForKeylockChange method and the StatusUpdateEvent event.)

Key switch of the USB PKBST



Key position on the PKBST-5x	Constant of OPOS control (KeyPosition property)
4	LOCK_KP_LOCK 1
3	LOCK_KP_NORM 2
2	LOCK_KP_SUPR +1 4
1	LOCK_KP_SUPR +2 5
8	LOCK_KP_SUPR +3 6
7	LOCK_KP_SUPR +4 7
5	LOCK_KP_SUPR+5 8
6	LOCK_KP_SUPR 3
Idle (Intermediate position)	LOCK_KP_SUPR +6 9

The OPOS specifies the values of the KeyPosition in the shaded cells.

KeyPosition of the USB PKBST Keylock Control

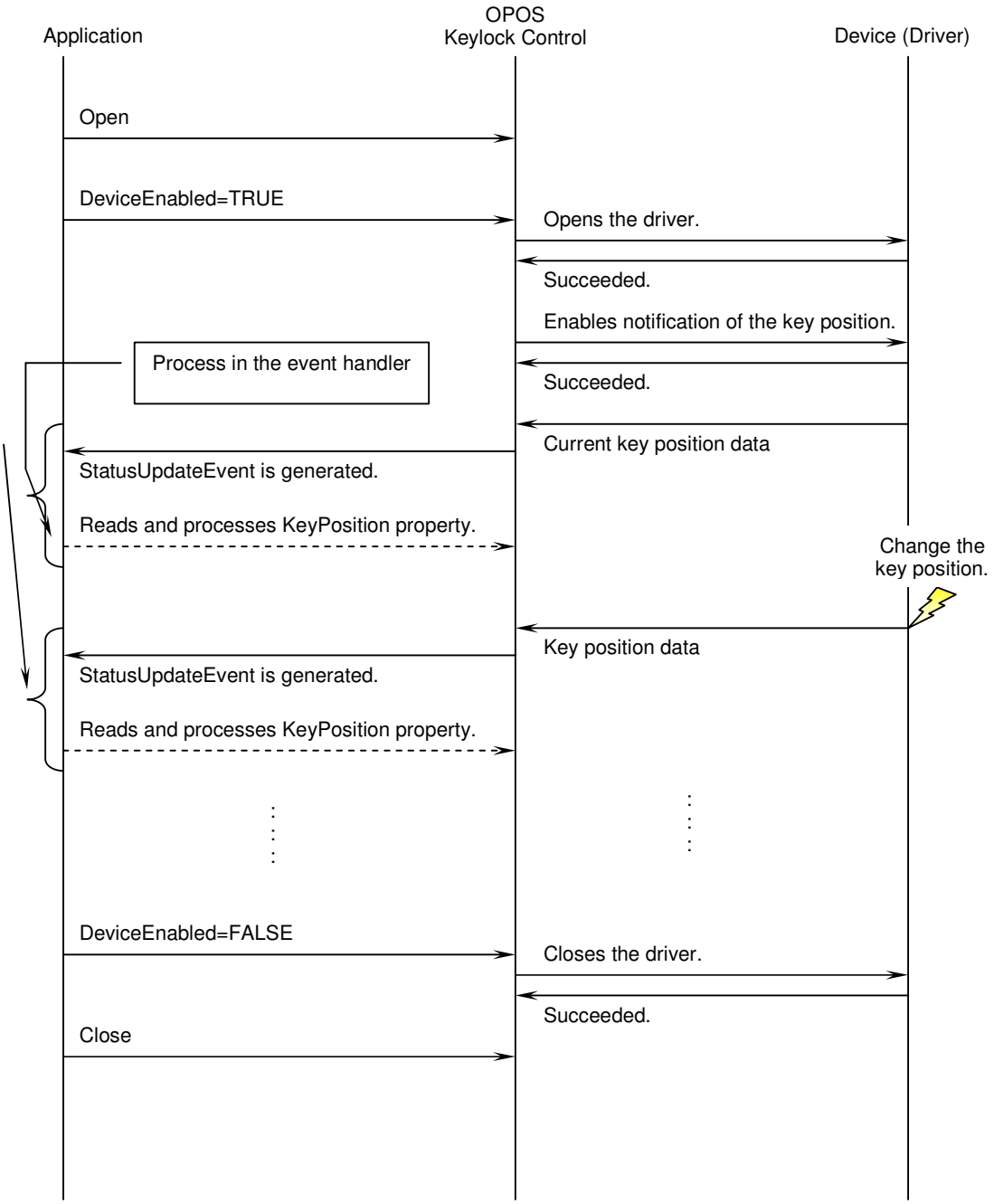
2) Auto sensing of the connected port
The USB keyboard is automatically sensed by the Service Object determined according to the open name. However, when two or more units of identical keyboard are connected, which device is sensed is unknown.

3) Plug-and-Play for USB Keyboard in operation
The USB keyboard is a plug-and-play device, but a disconnection and reconnection of the connector during operation is not recommended.

4) Notification of the power status
This control determines whether the power status of the keyboard is in "ON LINE" or "OFF or OFFLINE", and notifies of the result. This is substantially corresponding to the disconnection and reconnection of the USB keyboard connector. If TRUE is set for the DeviceEnabled property with the keyboard unconnected, OPOS_E_NOHARDWARE error occurs. Accordingly, the notification of the power status can be started only while the keyboard is connected. The subsequent operations follow the PowerNotify property.

2.1.8 Usage Example

This section gives a sequence diagram to show an operation flow from opening of the USB Keylock Control and reading an electronic key data to a close operation.



2.1.9 Log

This Control outputs the trace log and error log according to the settings in the registry.
The specification of the log is shown below.

(1) File name
PKBSTUB.LOG

(2) Size
Max. 4MB
After the data size reached the maximum, the new data afterwards will overwrite the chronologically oldest one.

(3) Format
Date, Time, [Function]<Error information>

(4) Log level
The extent of log data to be output depends on the following log levels.
0: No log is output.
1: Minimum log is output. Error logs are always output when the log level is set to "1".
2: Detailed log is output.

(5) Log data
No explanation is made in this document.

2.1.10 Result When Property/Method is Executed

The Control notifies the user of a result when a property/method is executed.

The table below shows the ResultCode Property values and OpenResult Property values described in this document.

ResultCode	Value
OPOS_SUCCESS	0
OPOS_E_CLOSED	101
OPOS_E_CLAIMED	102
OPOS_E_NOTCLAIMED	103
OPOS_E_NOSERVICE	104
OPOS_E_DISABLED	105
OPOS_E_ILLEGAL	106
OPOS_E_NOHARDWARE	107
OPOS_E_OFFLINE	108
OPOS_E_NOEXIST	109
OPOS_E_EXISTS	110
OPOS_E_FAILURE	111
OPOS_E_TIMEOUT	112
OPOS_E_BUSY	113
OPOS_E_EXTENDED	114

OpenResult	Value
OPOS_OR_ALREADYOPEN	301
OPOS_OR_REGBADNAM	302
OPOS_OR_REGPROGID	303
OPOS_OR_CREATE	304
OPOS_OR_BADIF	305
OPOS_OR_FAILEDOPEN	306
OPOS_OR_BADVERSION	307
OPOS_ORS_NOPORT	401
OPOS_ORS_NOTSUPPORTED	402
OPOS_ORS_CONFIG	403
OPOS_ORS_SPECIFIC	450
OPOS_ORS_BADCO	451
OPOS_ORS_RESOURCEFAIL	452
OPOS_ORS_ALREADYOPENED	453

1) Results When Property is Executed
The table below gives the results common to all available properties and those unique to certain property.

Property	ResultCode	Meaning	Error Handling
Common properties	OPOS_SUCCESS	Property setting was completed successfully.	–
	OPOS_E_CLOSED	The device has been closed.	Open the device using the Open method, then perform a setting again.
BinaryConversion	OPOS_E_ILLEGAL	An invalid value was specified.	Specify a valid parameter value.
DeviceEnabled	OPOS_E_NOHARDWARE	The device is not connected. Or, the device power is not on.	Make sure the device is connected and its power is on, then perform a setting again. If the error occurs again, reinstall the USB driver again. If the error still persists, then investigate the error.
	OPOS_E_BUSY	After initializing the device, the current key position cannot be obtained.	Perform a setting again while no key entry, no card input, or no beep sound is performed through the keyboard. If the error still persists, investigate the error.
	OPOS_E_FAILURE	After initializing the device, an undefined key position is obtained as the current key position.	Investigate the error.
		Initialization of the keyboard driver failed.	Re-install the driver kit suitable for the model of the POS terminal, then perform a setting again. If the error still persists, investigate the error.
PowerNotify	OPOS_E_ILLEGAL	An invalid value was specified.	Specify a valid value.
		The device is already enabled.	Unless CapPowerReporting property is OPOS_PR_NONE, the device is already enabled. Set DeviceEnabled property to FALSE, then perform a setting again.
		Power notification function is not supported.	In the case the CapPowerReporting property is OPOS_PR_NONE, the power notification function is not supported.
	OPOS_E_NOSERVICE	The version of the service object is so old that this property is not supported.	Install the latest service object.

2) Results When Open Method is Executed
The Open method differs from other methods and is separately described.

Value	ResultCode	OpenResult	Meaning	Error Handling
OPOS_SUCCESS	OPOS_SUCCESS	OPOS_SUCCESS	The device was successfully opened.	—
OPOS_E_ILLEGAL	—	OPOS_OR_ALREADYOPEN	The device has already been open.	Make sure the name of the device to be opened is correct.
OPOS_E_NOEXIST	OPOS_E_CLOSED	OPOS_OR_REG_BADNAME	The specified device name does not exist in the registry.	Make sure the name of the device to be opened is correct.
		OPOS_OR_REGPROGID	The service object has not been registered correctly.	Register the driver or service object again.
OPOS_E_NOSERVICE	OPOS_E_CLOSED	OPOS_OR_CREATE	The service object has not been registered correctly.	Register the driver or service object again.
		OPOS_OR_BADIF	The service object does not support the methods required.	Install this Control again.
		OPOS_OR_BADVERSION	The version of the service object is invalid.	Install this Control again.
		OPOS_ORS_CONFIG	The registry is not correct.	Add the registry again.
		OPOS_OR_FAILEDOPEN	An error occurred in the service object, but the service object does not support the OpenResult property.	Register the service object again and add the registry again.
		OPOS_ORS_BADCO	The control object does not support the methods required for the keylock.	Register the correct control object again.

3) Results When A Method Is Executed

The table below describes the result when each method other than the Open method is executed.

Method	Return Value/ResultCode	ResultCodeExtended	Meaning	Error Handling
Close	OPOS_SUCCESS	—	The device was successfully closed.	—
	OPOS_E_CLOSED	—	The device has already been closed.	—
Claim ClaimDevice	OPOS_E_ILLEGAL	—	The keylock does not support the exclusive access function.	—
Release ReleaseDevice	OPOS_E_ILLEGAL	—	The keylock does not support the exclusive access function.	—
CheckHealth	OPOS_SUCCESS	—	A series of health check normally terminated.	—
	OPOS_E_CLOSED	—	The device has been closed.	Open the device using the Open method, then execute the method again.
	OPOS_E_DISABLED	—	The device is disabled.	Set the DeviceEnabled property to TRUE, then execute the method again.
	OPOS_E_ILLEGAL	—	Unsupported health check level was specified. Or, unexpected result was returned from the driver.	Check the health check level. If there is no problem with the health check level, investigate the error.
	OPOS_E_FAILURE	—	An error was found during a series of health check. In the case of the interactive level, this indicates the result of a user's visual check.	After eliminating the cause of the error, execute the method again. If there is no problem with the device, investigate the error.
	OPOS_E_NOHARDWARE	—	No response was returned from the device. Or, the device is not connected.	Check the device for the connection. If there is no problem with the connection, re-install the driver kit suitable for the model of the POS terminal, then execute the method again. If the error still persists, then investigate the error.
	OPOS_E_BUSY	—	The current key position cannot be obtained in the EXTERNAL level test.	Perform a setting again while no key entry, no card input, or no beep sound is performed through the keyboard. If the error still persists, investigate the error.

Method	Return Value/ResultCode	ResultCodeExtended	Meaning	Error Handling
DirectIO	OPOS_E_ILLEGAL	—	Not supported.	—
ResetStatistics	OPOS_E_CLOSED	—	The device has been closed.	Open the device using the Open method, then execute the method again.
	OPOS_E_ILLEGAL	—	Either CapStatisticsReporting property or CapUpdateStatistics property is FALSE. Or, the all specified statistics are undefined or non-resettable.	In the case CapStatisticsReporting property is set to FALSE, the statistics function is not supported. In the case CapUpdateStatistics property is set to FALSE, the statistics information is non-changeable and non-resettable. Otherwise, specify the statistics having the defined name or resettable statistics.
	OPOS_E_NOSERVICE	—	The version of the service object is so old that the method is not supported.	Install the latest service object.
RetreiveStatistics	OPOS_E_CLOSED	—	The device has been closed.	Open the device using the Open method, then execute the method again.
	OPOS_E_ILLEGAL	—	The CapStatisticsReporting property is set to FALSE. Or, the all specified statistics are undefined.	In the case the CapStatisticsReporting property is set to FALSE, the statistics function is not supported. Otherwise, specify the statistics having the defined name.
	OPOS_E_NOSERVICE	—	The version of the service object is so old that the method is not supported.	Install the latest service object.
UpdateStatistics	OPOS_E_CLOSED	—	The device has been closed.	Open the device using the Open method, then execute the method again.
	OPOS_E_ILLEGAL	—	Either CapStatisticsReporting property or CapUpdateStatistics property is FALSE. Or, the all specified statistics are undefined or non-changeable.	In the case the CapStatisticsReporting property is set to FALSE, the statistics function is not supported. In the case CapUpdateStatistics property is set to FALSE, the statistics information is non-changeable and non-resettable. Otherwise, specify the statistics having the defined name or resettable statistics.
	OPOS_E_NOSERVICE	—	The version of the service object is so old that the method is not supported.	Install the latest service object.

Method	Return Value/ResultCode	ResultCodeExtended	Meaning	Error Handling
WaitForKeylockChange	OPOS_SUCCESS	—	The key lock is now in the specified position or has already been in the specified position.	—
	OPOS_E_CLOSED	—	The device has been closed.	Open the device using the Open method, then execute the method again.
	OPOS_E_DISABLED	—	The device is disabled.	Set the DeviceEnabled property to TRUE, then execute the method again.
	OPOS_E_ILLEGAL	—	An invalid value was specified for the Timeout.	Specify a correct value, then execute the method again.
		—	An invalid KeyPosition was specified.	Specify a correct value, then execute the method again.
	OPOS_E_TIMEOUT	—	The key position could not be allocated to the specified position within a specified period of time.	—