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WORKSHOP

AGREEMENT

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J/eXtensions for Financial Services (J/XFS) for the Java Platform - Part 3: Magnetic Stripe & Chip Card Device Class Interface - Programmer's Reference

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36   B-1050 Brussels

Contents

Foreword

This CWA contains the specifications that define the J/eXtensions for Financial Services (J/XFS) for the Java ™ Platform, as developed by the J/XFS Forum and endorsed by the CEN/ISSS J/XFS Workshop. J/XFS provides an API for Java applications which need to access financial devices. It is hardware independent and, by using 100% pure Java, also operating system independent.

The CEN/ISSS J/XFS Workshop gathers suppliers (among others the J/XFS Forum members), service providers as well as banks and other financial service companies. A list of companies participating in this Workshop and in support of this CWA is available from the CEN/ISSS Secretariat. The specification was agreed upon by the J/XFS Workshop Meeting of 2002-09-25/26 in Barcelona and a subsequent electronic review by the Workshop participants, and the final version was sent to CEN for publication on 2002-12-06.

The specification is continuously reviewed and commented in the CEN/ISSS J/XFS Workshop. The information published in this CWA is furnished for informational purposes only. CEN/ISSS makes no warranty expressed or implied, with respect to this document. Updates of the specification will be available from the CEN/ISSS J/XFS Workshop public web pages pending their integration in a new version of the CWA (see: http://www.cenorm.be/cenorm/businessdomains/businessdomains/informationsocietystandardizationsystem/applying+technologies/j-xfs+workshop/index.asp).

The J/XFS specifications are now further developed in the CEN/ISSS J/XFS Workshop. CEN/ISSS Workshops are open to all interested parties offering to contribute. Parties interested in participating should contact the CEN/ISSS Secretariat (isss@cenorm.be). To submit questions and comments for the J/XFS specifications, please contact the J/XFS Workshop Secretariat hosted in CEN/ISSS (jxfs-helpdesk@cenorm.be).

Questions and comments can also be submitted to the members of the J/XFS Forum, who are all CEN/ISSS J/XFS Workshop members, through the J/XFS Forum web-site http://www.jxfs.com

This CWA is composed of the following parts:

- Part 1: J/eXtensions for Financial Services (J/XFS) for the Java Platform - Base Architecture - Programmer's Reference
- Part 2: J/eXtensions for Financial Services (J/XFS) for the Java Platform - Pin Keypad Device Class Interface - Programmer's Reference
- Part 3: J/eXtensions for Financial Services (J/XFS) for the Java Platform - Magnetic Stripe & Chip Card Device Class Interface - Programmer's Reference
- Part 4: J/eXtensions for Financial Services (J/XFS) for the Java Platform - Text Input/Output Device Class Interface - Programmer's Reference
- Part 5: J/eXtensions for Financial Services (J/XFS) for the Java Platform - Cash Dispenser, Recycler and ATM Interface - Programmer's Reference
- Part 6: J/eXtensions for Financial Services (J/XFS) for the Java Platform - Printer Device Class Interface - Programmer's Reference
- Part 7: J/eXtensions for Financial Services (J/XFS) for the Java Platform - Alarm Device - Programmer's Reference
- Part 8: J/eXtensions for Financial Services (J/XFS) for the Java Platform - Sensors and Indicators Unit Device Class Interface - Programmer's Reference
- Part 9: J/eXtensions for Financial Services (J/XFS) for the Java Platform - Depository Device Class Interface - Programmer's Reference
- Part 10: J/eXtensions for Financial Services (J/XFS) for the Java Platform - Check Reader/Scanner Device Class Interface - Programmer's Reference
- Part 11: J/eXtensions for Financial Services (J/XFS) for the Java Platform - Camera Specification - Programmer's Reference
- Part 12: J/eXtensions for Financial Services (J/XFS) for the Java Platform - Vendor Dependant Mode Specification - Programmer's Reference

CWA 14923-3:2004 replaces CWA 13937-3:2003 and should be read in conjunction with CWA 13937-3:2000, which contains the previous release of the J/XFS specification

HISTORY

The main differences to the previous CWA 13937:2000 are:

- Modified readata method description
- Modified ejectCard method, status event added
- Modified retainCard method, status event added
- Corrected some typing errors
- Added missing clarification on the writeData method
- Removed the JXFS_E_CLAIMED exception
- Removed “media taken” as a code for an intermediate event, at section 6.3
- Added JXFS_S_MEDIA_STATUS events at the ejectCard and reatinCard methods of the motorized card interface.
- Added class hierarchy diagram
- Modified the Description of the readData method of the IJxfsMagStripeControl interface, relating to the magnetic pre-head detection.
- Added paragraph describing handling of null parameters
- Changed from lowercase “j” to uppercase “J” in all interface names starting with “IJxfs…”

1 Scope

This document describes the Magnetic Stripe Device (MSD) as well as Chip Card Device (CCD) classes based on the basic architecture of J/XFS which is similar to the JavaPOS architecture. It is event driven and asynchronous.

Three basic levels are defined in JavaPOS. For J/XFS this model is extended by a communication layer, which provides device communication that allows distribution of applications and devices within a network. So we have the following layers in J/XFS :

- Application
- Device Control and Device Manager
- Device Communication
- Device Service

Application developers program against control objects and the Device Manager which reside in the Device Control layer. This is the usual interface between applications and J/XFS devices. Device Control objects access the Device Manager to find an associated Device Service. Device Service objects provide the functionality to access the real device (i.e. like a device driver).
During application startup the Device Manager is responsible for locating the desired Device Service object and attaching this to the requesting Device Control object. Location and/or routing information for the Device Manager reside in a central repository.

To support Magnetic Stripe devices and Chip Card devices the basic Device Control structure is extended with various properties and methods specific to this device which are described on the following pages.

2 Overview

2.1 Description

This document describes the J/XFS support classes for both Magnetic Stripe devices (MSD) as well as Chip Card devices (CCD).

As well as the rest of J/XFS device controls, J/XFS Magnetic Stripe and J/XFS Chip Card devices use the event driven model and the same behavioral model. Therefore, in the case of a Magnetic Stripe device, the application will instantiate a J/XFS Magnetic Stripe Device Control Object and then use the available methods to do I/O. When an I/O method is called, the J/XFS Magnetic Stripe Device Service will attempt to process the requested I/O. If the request is invalid or an exception is encountered, the application will be notified by a J/XFS exception. Completion of the request will be reported by an event. Thus the application must register itself with the J/XFS Magnetic Stripe Device Control Object for the various types of events it wishes to handle.

The same model applies to all J/XFS device controls and, in particular, to the Chip Card Device control.

2.1.1 Magnetic Stripe Device

The J/XFS Magnetic Stripe Reader/Encoder Device Support allows for the operation of devices with magnetric stripe read/write capabilities. Following are typical devices with such a capability:

- motor driven card reader/writer
- pull through card reader/writer
- dip card reader/writer

The following tracks and the corresponding international standards are taken into account in this document:

Track 1	ISO 7811
Track 2	ISO 7811
Track 3	ISO 7811 / ISO 4909

In addition to the pure reading of the tracks mentioned above, security boxes can be used via this service to check the data of writable tracks for manipulation. These boxes (such as CIM or MM) are sensor-equipped devices that are able to check some other information on the card and compare it with the track data.

Leds handling will be defined based on initialization configuration so no reference to them is made in this document.

Handling of *watermark* is also considered.

2.1.2 Chip Card Device

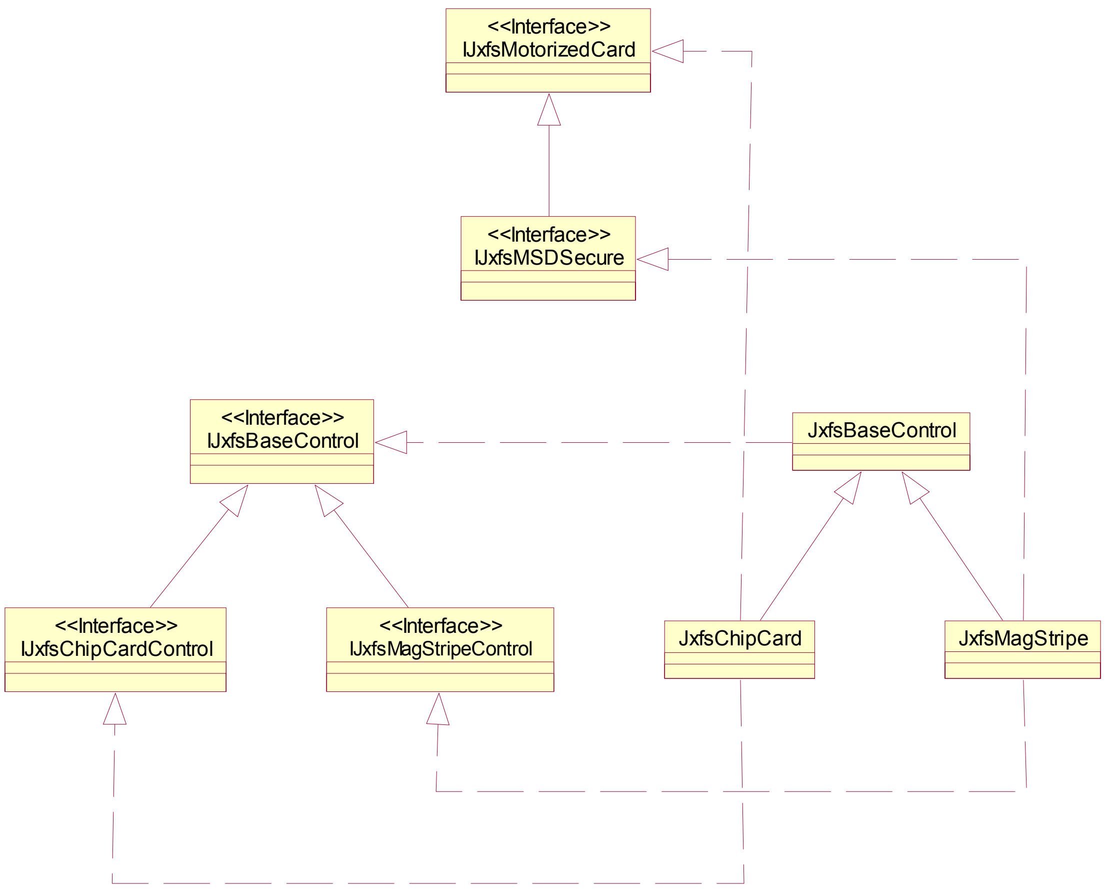
The J/XFS Chip Card Device Support allows for the operation of devices with chip access capabilities. Following are typical devices with such a capability:

- motor driven chip card devices.
- dip chip card devices.

The following chips and the corresponding international standards are taken into account in this document:

- Chip (contacted) ISO 7816

2.2 Class Hierarchy



2.3 Classes and Interfaces

The following classes and interfaces are used by the J/XFS MSD and CCD Device Controls. In order to support the definition of the different properties of the different devices (see Introduction), the Device Controls are defined in a class hierarchy.

Class or Interface	Name	Description	Extends or Implements
Interface	**IJxfsBaseControl**	Base interface for all the device controls. Contains methods common to all the device controls.	
Interface	**IJxfsMagStripeControl**	Base interface for MSD controls. Contains method declarations specific to MSD controls.	Extends: **IJxfsBaseControl**
Interface	**IJxfsMagStripeService**	Base interface for MSD services. Contains the methods specific to the device services for the MSD device category.	Extends: **IJxfsBaseService**
Interface	**IJxfsChipCardControl**	Base interface for CCD controls. Contains method declarations specific to CCD controls.	Extends: **IJxfsBaseControl**
Interface	**IJxfsChipCardService**	Base interface for CCD services. Contains the methods specific to the device services for the CCD device category.	Extends: **IJjxfsBaseService**
Interface	**IJxfsMotorizedCard**	Interface for motorized card devices. Contains method declarations specific to motorized card devices.	
Interface	**IJxfsMotorizedCardServic e**	This interface should be implemented by MSD or CCD device services that provide access to a motorized device.	
Interface	**IJxfsMSDSecure**	Interface for motorized card devices with secure module. Contains method declarations specific to card devices with secure module.	Extends: **IJxfsMotorizedCard**
Interface	**IJxfsMSDSecureService**	This interface should be implemented by device services that provide access to devices with a secure module.	
Class	**JxfsBaseControl**	Base class for all the device controls. Contains properties common to all the deviceb controls.	
Class	**JxfsMagStripe**	Base class for MSD controls. Contains properties specific to MSD device controls.	Implements: **IJxfsMagStripeControl** **IJxfsMSDSecure**
Class	**JxfsChipCard**	Base class for CCD controls. Contains properties specific to CCD device controls.	Implements: **IJxfsChipCardControl** **IJxfsMotorizedCard**

2.4 Support Classes

Class or Inter-face	Name	Description	Extends / Implements
Interface	**JxfsConst**	Interface containing the Jxfs constants that are common to several device categories	--
Interface	**JxfsMSDConst**	Interface containing the Jxfs constants that are common to all the MSD device controls.	**--**
Interface	**JxfsCCDConst**	Interface containing the Jxfs constants that are common to all the CCD device controls.	**--**
Interface	**JxfsMotorizedCardConst**	Interface containing the Jxfs constants for motorized card devices.	**--**
Class	**JxfsMSDTracks**	MSD Track selector class. Indicates for each track if its selected or not. Properties are read only.	Extends: **JxfsType**
Class	**JxfsMSDTrackSelection**	Subclass of MSD Track selector class. It contains the same properties but they can be set by applications.	Extends: **JxfsMSDTracks**
Class	**JxfsMSDReadData**	Data class that contains data returned in Operation Complete events for MSD *readData()* operation.	Extends: **JxfsType**
Class	**JxfsCCDData**	Data class that contains data returned in Operation Complete events for CCD input/output operations.	Extends: **JxfsType**
Class	**JxfsMSDWmData**	Data class that contains data returned in Operation Complete events for MSD *readWMtrack()* operation.	Extends: **JxfsType**
Class	**JxfsMSDSecureMode**	Data class that provides required properties for *readData()* operation in secure mode.	Extends: **JxfsType**
Class	**JxfsMSDReadDataSecure**	Data class that contains data returned in Operation Complete events for MSD *readData()* in secure mode.	Extends: **JxfsType**
Class	**JxfsEvent**	Abstract class from which all Jxfs event classes are extended	Extends: **java.util. EventObject**
Class	**StatusEvent** **OperationCompleteEvent** **IntermediateEvent**	The Device Service creates instances of this classes and delivers them through the J/XFS MSD Device Control's event callbacks to the application	Extend: **JxfsEvent**
Class	**JxfsException**	Exception class. The J/XFS MSD Device Control creates and throws exceptions on method failure and property access failure.	Extends: **java.lang.Exception**

3 Device behavior

3.1 Device open()

During the device open call the Device Service tries to access the connected device. This fails for the following circumstances:

JXFS_E_HARDWAREERROR	If the device could not be accessed. This may be that the device is not connected or broken. This is returned as the result property in an OperationCompleteEvent.
JXFS_E_OPEN	The open was already done by this Device Control. This is returned as the errorCode field in a JxfsException.

3.2 Handling of null parameters

If null is passed as a method parameter, a JxfsException exception with the errorCode property set to JXFS_E_PARAMETER_INVALID will be thrown, unless the handling of a null parameter is explicitly specified for a particular method.

4 Classes and Interfaces

All operation methods return an identificationID. If an operation cannot be processed because of an error detected before the asynchronous processing of the method begins (i.e. before the calling thread returns) a JxfsException is thrown.After processing has taken place, an OperationCompleteEvent is generated which contains detailed information about the status of the operation, i.e., if it failed or succeeded, and eventually additional data as a result.

The Constants, Error Codes, Exceptions, Status Codes and Support Classes that are used in the methods are described in special chapters at the end of the documentation.

4.1 Access to properties

Please note the following when determining the meaning of a property's **Access**:

R	The property is read only.
W	The property is write only.
R/W	The property may be read or written.

To access these properties the applications must use the appropriated methods specified by the JavaBean specification.

get*Property*

Syntax	**Propert*y get*Property *() throws JxfsException***
Description	Returns the requested property.
Parameter	**None**
Event	No additional events are generated.
Exceptions	Some possible JxfsException *value codes*: JXFS_E_CLOSED JXFS_E_UNREGISTERED JXFS_E_REMOTE

set*Property*

Syntax	**void *set*Property *(value) throws JxfsException***
Description	Sets the requested property.
Parameter	The desired property value.
Event	No additional events are generated
Exceptions	Some possible JxfsException *value codes*: JXFS_E_CLOSED JXFS_E_UNREGISTERED JXFS_E_REMOTE JXFS_E_PARAMETER_INVALID

4.2 Exceptions

All the methods described for the specified interfaces can throw at least some of the following exceptions:

Value	**Meaning**
JXFS_E_CLOSED	The Device Control has not been opened.
JXFS_E_UNREGISTERED	The device is not registered at the JxfsDeviceManager.
JXFS_E_REMOTE	A network error ocurred.
JXFS_E_PARAMETER_INVALID	A parameter is invalid.
JXFS_E_NOT_SUPPORTED	The function is not supported.

Only if a method can throw additional exceptions this is explicitly mentioned.

4.3 IJxfsMagStripeControl

4.3.1 Introduction

The J/XFS MSD Device Control Subclass is defined in JxfsMagStripe and is a subclass of JxfsBaseControl. Its interface is defined in IJxfsMagStripeControl interface which is a subclass of IJxfsBaseControl interface. The purpose of the J/XFS MSD Device Control object is to allow passing data and control between the application and the device support code so that the associated device can be accessed.

Summary

Although IJxfsMagStripeControl is an interface, and therefore properties do not apply, properties are detailed here with the objective to provide guidance on the implementation of those classes that will implement this interface.

Therefore, the IJxfsMagStripeControl consists on the following methods:

- Getters of listed properties.
- Methods listed.

Property	Type	Access	Initialized after
deviceType	int	R	After service instantiation
mediaStatus	**JxfsMediaStatus**	R	After successful open
supportedReadTracks	**JxfsMSDTracks**	R	After successful open
supportedWriteTracks	**JxfsMSDTracks**	R	After successful open

Method	Return	May be used after
get*Property*	*Property*	After successful open
readData	identificationID	After successful open
writeData	identificationID	After successful open

4.3.2 Properties

deviceType Property (R)

Type	***Int***
Initial Value	Depends on device type.
Description	Identifies a type of MSD device. Depending on the device type it will be a combination of the following flags:

Value	**Meaning**
JXFS_MSD_TYPE_SWIPE	Swipe/pull through magnetic stripe reader/encoder.
JXFS_MSD_TYPE_DIP	Dip magnetic card reader/encoder.
JXFS_MSD_TYPE_MOTOR	Motorized card reader.

mediaStatus Property (R)

Type	***JxfsMediaStatus***
Initial Value	A JxfsMediaStatus (see related section in Base Architecture document).
Description	Specifies the state of the media.
Event	If the value of this property changes, the Device Service will send all registered StatusListeners a StatusEvent with the following values:

Field	**Value**
status	JXFS_S_MSD_MEDIA_STATUS *mediaStatus* has changed.
details	A ***JxfsMediaStatus*** object.

supportedReadTracks Property (R)

Type	***JxfsMSDTracks***
Initial Value	Null until open.
Description	Indicates which tracks can be physically read by the device.

supportedWriteTracks Property (R)

Type	***JxfsMSDTracks***
Initial Value	Null until open.
Description	Indicates which tracks can be physically written by the device.

4.3.3 Methods

readData Method

Syntax

identificationID readData (JxfsMSDTrackSelection tracksToRead) throws JxfsException;

Description

This method launches a read operation to obtain the data contained in the tracks specified by the *tracksToRead* parameter.

If media is present, the read operation is performed immediately. Otherwise, the device waits until it is present or the operation is cancelled.
After a successful completion of this input operation, an *OperationCompleteEvent* event is issued to inform the application of the results.
Many motorized card readers on the market have an option called magnetic pre-head detection. If this option is active, then only cards with a magnetized stripe may enter the device, so in this case a card is never entered the wrong way. In the case that the device does not have this option or the option has to be deactivated because the device shall also accept smart cards without magnetic stripe, then current devices cannot distinguish between the cases of a card entered in the wrong way and a card with read errors on all stripes. Therefore in both cases JXFS_E_MSD_READFAILURE should be returned.

Parameter

Type	Name	Meaning
JxfsMSDTracksSelection	tracksToRead	Tracks to be read.

Event

OperationCompleteEvent
When a *readData ()* operation is completed an *OperationCompleteEvent* event will be sent by MSD Device Control to all registered OperationCompleteListeners. It will contain the data read.

Field	Value
operationID	JXFS_O_MSD_READDATA
identificationID	Identification ID of complete operation.
result	JXFS_RC_SUCCESSFUL Operation completed successfully. JXFS_E_CANCELLED Operation was cancelled. JXFS_E_MSD_READFAILURE No read conditions were satisfied (that is, not all tracks specified in *tracksToRead* parameter have been read). It is possible, however, that some tracks could be

read. Check *data* object for extended information on tracks actually read.
JXFS_E_MSD_NOMEDIA
Media was removed before operation completion.
JXFS_E_MSD_INVALIDMEDIA
No appropriated media was found.
JXFS_E_MSD_MEDIAJAMMED
Media is jammed.
JXFS_E_MSD_SHUTTERFAIL
Shutter could not be opened.

data A **JxfsMSDReadData** object.

IntermediateEvent

IntermediateEvent can be sent by MSD Device Control to all registered IntermediateListeners

Field	**Value**
operationID	JXFS_O_MSD_READDATA
identificationID	Identification ID of operation.
reason	JXFS_I_MSD_NO_MEDIA_PRESENT The read operation request cannot progress because there is no media inserted. JXFS_I_MSD_MEDIA_INSERTED The read operation request continues because a media has been inserted.
data	null

Exceptions

Some possible JxfsException *value codes*. See section on JxfsExceptions for other JxfsException value codes.

Value	**Meaning**
JXFS_E_MSD_NOTSUPPORTEDTRACK	At least one track specified in *tracksToRead* parameter is not supported by the device.
JXFS_E_MSD_NOTRACKS	No tracks specified in *tracksToRead* parameter.

writeData Method

Syntax

identificationID writeData (java.util.Vector wdata, boolean newCard) throws JxfsException;

Description

This method initiates a write operation of the data contained in w*data*.

If media is present, the write operation is performed immediately. Otherwise, the device waits until it is present or the operation is cancelled. If the parameter *newCard* contains *true*, the card must be inserted *after* the operation is started.
Each vector element of w*data* is a byte [ ] with the data to be written in each track. Vector element 0 contains data for track 1, vector element 1 contains data for track 2, and so on.

The track data should have no hardware control characters or BCC included (like SS, SE or BCC). The data for ISO track #1 (6 bits per character) is transformed in the range of 0x20 to 0x5F and the data for the ISO tracks #2 and #3 (4 bits per character) are transformed in the range from 0x30 to 0x3F.

If the card is removed from the device during the write operation, the JXFS_E_MSD_NOMEDIA error code should be returned.
The use of the newCard parameter is deprecated. It is recommended

that it is not used, i.e., that *false* is specified.

If no data has to be written for a given track, the corresponding vector element has to contain null.

After a successful completion of this output operation, an *OperationCompleteEvent* event is issued to inform the application of the results.

Parameter

Type	**Name**	**Meaning**
java.util.Vector	wdata	Data to be written. Each vector element contains a byte [ ] of raw data per track. A null vector element is assumed no data to be written for its associated track.
Boolean	newCard	If false, it specifies that the operation may proceed when a card is already present.

Event

OperationCompleteEvent
When a *writeData ()* operation is completed an *OperationCompleteEvent* event will be sent by MSD Device Control to all registered OperationCompleteListeners.

Field	**Value**
operationID	JXFS_O_MSD_WRITEDATA
identificationID	Identification Id of complete operation.
result	JXFS_RC_SUCCESSFUL Operation completed successfully. JXFS_E_CANCELLED Operation was cancelled by application or there was a card already present and *waitCard* value was true. JXFS_E_MSD_WRITEFAILURE No write conditions were satisfied. It is possible, however, that some tracks could be written. Check *data* object for extended information on tracks actually written. JXFS_E_MSD_NOMEDIA Media was removed before operation completion. JXFS_E_MSD_INVALIDMEDIA No appropriated media was found. JXFS_E_MSD_BADDATA Data is invalid. JXFS_E_MSD_MEDIAJAMMED Media is jammed. JXFS_E_MSD_SHUTTERFAIL Shutter could not be opened.
data	A **JxfsMSDTracks** object.

IntermediateEvent
IntermediateEvent can be sent by MSD Device Control to all registered IntermediateListeners

Field	**Value**
operationID	JXFS_O_MSD_WRITEDATA
identificationID	Identification Id of operation.

reason	JXFS_I_MSD_NO_MEDIA_PRESENT The write operation request cannot progress because there is no media inserted. JXFS_I_MSD_MEDIA_INSERTED The write operation request continues because a media has been inserted.
data	null

Exceptions Some possible JxfsException *value codes*. See section on JxfsExceptions for other JxfsException value codes.

Value	**Meaning**
JXFS_E_MSD_NOTSUPPORTEDTRACK	At least one of the specified tracks is not supported by the device.
JXFS_E_MSD_NOTRACKS	No track data has been specified.

4.4 IJxfsChipCardControl

4.4.1 Introduction

The J/XFS Chip Card Device Control Subclass is defined in JxfsChipCard and is a subclass of JxfsDeviceControl. Its interface is defined in IJjxfsCCDControl interface which is a subclass of IJxfsBaseControl interface. The purpose of the J/XFS CCD Device Control object is to allow passing data and control between the application and the device support code so that the associated device can be accessed.

This class represents a physical device (or part of it) that has chip card access capabilities (send/receive of commands and data).

Summary

Although IJxfsChipCardControl is an interface, and therefore properties do not apply, properties are detailed here with the objective to provide guidance in the implementation of those classes that will implement this interface.

Therefore, the IJxfsChipCardControl consists on the following methods:

- Getters of listed properties.
- Methods listed.

Property	Type	Access	Initialized after
deviceType	int	R	After service instantiation
mediaStatus	**JxfsMediaStatus**	R	After successful open

Method	Return	May be used after
get*Property*	*Property*	After successful open
isCcdT	boolean	After successful open
chipInit	*identificationID*	After successful open
chipIO	*identificationID*	After successful open

4.4.2 Properties

deviceType Property (R)

Type *Int*
Initial Value Depends on device type.
Description Identifies a type of Chip Card device. Depending on the device type it will be a combination of the following flags:

Value	**Meaning**
JXFS_CCD_TYPE_SWIPE	Swipe/pull through chip card device.
JXFS_CCD_TYPE_DIP	Dip chip card device.
JXFS_CCD_TYPE_MOTOR	Motorized chip card device.
JXFS_CCD_TYPE_CONTACTLESS	Contactless chip card device.

mediaStatus Property (R)

Type *JxfsMediaStatus*
Initial Value A JxfsMediaStatus (see related section in Base Architecture document).
Description Specifies the state of the media.
Event If the value of this property changes, the Device Service will send all

registered StatusListeners a StatusEvent with one of the following values:

Field	**Value**
status	JXFS_S_CCD_MEDIA_STATUS *mediaStatus* has changed.
details	A ***JxfsMediaStatus*** object.

4.4.3 Methods

isCcdT Method

Syntax ***boolean isCcdT (int noOfProtocol) throws JxfsException;***

Description This method is used to obtain information on which protocols are supported by the device.
Returns TRUE if protocol Tnn, where nn is the value of the parameter, is supported, FALSE otherwise.

Parameter

Type	**Name**	**Meaning**
int	noOfProtocol	Number of protocol being queried, from 0 to 15 for protocols T0 to T15.

Exceptions No additional exceptions are generated. See section on JxfsExceptions for common value codes.

chipInit Method

Syntax ***identificationID chipInit () throws JxfsException;***

Description Performs a chip card initialization and reads the answer to reset (ATR) data.

If media is present, the operation is performed immediately. Otherwise, the device waits until it is present or the operation is cancelled .

After a successful completion of this operation, an *OperationCompleteEvent* event is issued to inform the application of the result.

Event **OperationCompleteEvent**
When a *chipInit()* operation is completed an *OperationCompleteEvent* event will be sent by CCD Device Control to all registered OperationCompleteListeners. It will contain the data read.

Field	**Value**
operationID	JXFS_O_CCD_CHIPINIT
identificationID	Identification Id of complete operation.
result	JXFS_RC_SUCCESSFUL Operation completed successfully. Check *data* field for ATR data from chip.
	JXFS_E_CANCELLED Operation was cancelled.
	JXFS_E_CCD_IOERROR IO error occurred. No ATR data is available.
	JXFS_E_CCD_NOMEDIA Media was removed before operation completion.
	JXFS_E_CCD_INVALIDMEDIA No appropriated media was found.
	JXFS_E_CCD_MEDIAJAMMED

	Media is jammed
	JXFS_E_CCD_SHUTTERFAIL
	Shutter could not be opened.
data	A **JxfsCCDData** object.
	It contains ATR data from chip.

IntermediateEvent

IntermediateEvent can be sent by CCD Device Control to all registered IntermediateListeners

Field	**Value**
operationID	JXFS_O_CCD_CHIPINIT
identificationID	Identification Id of operation.
reason	JXFS_I_CCD_NO_MEDIA_PRESENT The read operation request cannot progress because there is no media inserted. JXFS_I_CCD_MEDIA_INSERTED The read operation request continues because a media has been inserted.
data	null

Exceptions No additional exceptions are generated. See section on JxfsExceptions for common value codes.

chipIO Method

Syntax ***identificationID chipIO (byte[ ] chipData, int protocol) throws JxfsException;***

Description This method initiates an input/output operation. The contents of *chipData* is sent to the chip card. Replied data from the chip card is returned to the application in an *OperationCompleteEvent* event. The parameter *protocol* specifies the protocol to use.

After a successful completion of this operation, a *OperationCompleteEvent* event is issued to inform the application of the results.

Parameter

Type	**Name**	**Meaning**
byte[ ]	chipData	Data to be sent.
int	protocol	Protocol to be used (0..15).

Event **OperationCompleteEvent**

When a *chipIO ()* operation is completed an *OperationCompleteEvent* event will be sent by CCD Device Control to all registered OperationCompleteListeners. It will contain the data read.

Field	**Value**
operationID	JXFS_O_CCD_CHIPIO
identificationID	Identification Id of complete operation.
result	JXFS_RC_SUCCESSFUL Operation completed successfully. Check *data* field for data returned from chip. JXFS_E_CANCELLED Operation was cancelled. JXFS_E_CCD_IOERROR IO error occurred. No data is available. JXFS_E_CCD_NOMEDIA Media was removed before operation completion JXFS_E_CCD_INVALIDMEDIA No appropriated media was found. JXFS_E_CCD_MEDIAJAMMED Media is jammed. JXFS_E_CCD_SHUTTERFAIL

	Shutter could not be opened.
	JXFS_E_CCD_BADDATA
	Chip reported data was bad.
	JXFS_E_CCD_BADPROTOCOL
	Protocol not supported.
data	A **JxfsCCDData** object. It contains data returned from chip if operation completed successfully.

IntermediateEvent

IntermediateEvent can be sent by CCD Device Control to all registered IntermediateListeners

Field	**Value**
operationID	JXFS_O_CCD_CHIPIO
identificationID	Identification Id of operation.
reason:	JXFS_I_CCD_NO_MEDIA_PRESENT
	The read operation request cannot progress because there is no media inserted.
	JXFS_I_CCD_MEDIA_INSERTED
	The read operation request continues because a media has been inserted.
data	null

Exceptions No additional exceptions are generated. See section on JxfsExceptions for common value codes.

4.5 IJxfsMotorizedCard

4.5.1 Introduction

This interface contains those properties and functions commonly supported in motorized card devices (such as motorized magnetic card readers/encoder and chip card stations) related with its mechanical capabilities like eject or retain cards.

It is intended that this interface will be implemented by device controls that represent physical devices able to manage cards with chip or magnetic stripes (that is, subclasses of JxfsMagStripe and JxfsChipCard classes) that are equipped with motorized and mechanical capabilities.

Summary

Although IJxfsMotorizedCard is an interface, and therefore properties do not apply, properties are detailed here with the objective to provide guidance in the implementation of those classes that will implement this interface.

Therefore, the IJxfsMotorizedCard consists on the following methods:

- Getters of listed properties.
- Methods listed.

Property	Type	Access	Initialized after
powerOffCapabilities	int	R	
powerOnCapabilities	int	R	
retainBinStatus	**JxfsThresholdStatus**	R	
retainCardCount	int	R	
retainCapability	boolean	R	
secureModuleType	int	R	

Method	Return	May use after
get*Property*	*Property*	
set*Property*	*void*	
resetRetainCardCount	*void*	
ejectCard	identificationID	
retainCard	identificationID	

4.5.2 Properties

powerOffCapabilities Property (R)

Type	***Int***
Initial Value	Depends on device.
Description	Indicates the action taken by the device at power off if media is present. Depending on the device capabilities it will be set with one of the following values:

Value	**Meaning**
JXFS_MOTOR_EJECT	Card is ejected.
JXFS_MOTOR_EJECT_THEN_RETAIN	Card is ejected, then, after some seconds, it is retained.
JXFS_MOTOR_NOACTION	No action is taken.
JXFS_MOTOR_READ_POSITION	Card is brought to the read/write position.
JXFS_MOTOR_RETAIN	Card is retained.

powerOnCapabilities Property (R)

Type ***int***

Initial Value	Depends on device.
Description	Indicates the action taken by the device at power on if media is present. Depending on the device capabilities it will be set with one of the following values:

Value	Meaning
JXFS_MOTOR_EJECT	Card is ejected.
JXFS_MOTOR_EJECT_THEN_RETAIN	Card is ejected, then, after some seconds, it is retained.
JXFS_MOTOR_NOACTION	No action is taken.
JXFS_MOTOR_READ_POSITION	Card is brought to the read/write position.
JXFS_MOTOR_RETAIN	Card is retained.

retainBinStatus Property (R)

Type	***JxfsThresholdStatus***
Initial Value	A JxfsThresholdStatus (see related section in Base Architecture document).
Description	Indicates the fill status of the retain bin, if supported.
Event	If the value of this property changes, the Device Service will send all registered StatusListeners a StatusEvent with the following value:

Field	Value
status	JXFS_S_MOTOR_BIN_STATUS *retainBinStatus* has changed.
details	A ***JxfsThresholdStatus*** object.

retainCardCount Property (R/W)

Type	***int***
Initial Value	Depends on device at open.
Description	Number of cards retained. This value is persistent independently of the power/open/close state. The *resetRetainCardCount* method resets this property to 0.
Event	If the value of this property changes (increments), the Device Service will send all registered StatusListeners a StatusEvent with a status value of:

Field	Value
status	JXFS_S_MOTOR_BIN_CARDRETAINED *retainCardCount* has incremented.
details	None.

retainCapability Property (R)

Type	***Boolean***
Initial Value	Depends on device.
Description	Indicates if device is able to retain cards. True means it is able to retain, false no retain capability support.

secureModuleType Property (R)

Type	***Int***
Initial Value	Depends on device.
Description	Contains the secure module type, if any being used by the device.

Value	Meaning

JXFS_MSD_SECTYPE_NOTSUPPORTED	No security module available.
JXFS_MSD_SECTYPE_MMBOX	MMBox module.
JXFS_MSD_SECTYPE_CIM86	CIM86 module

4.5.3 Methods

resetRetainCardCount Method

Syntax ***void resetRetainCardCount ()***

Description Sets *retainCardCount* property to 0.

ejectCard Method

Syntax ***identificationID ejectCard () throws JxfsException;***

Description Ejects the card allowing card taking from user.

Event

OperationCompleteEvent
When a *ejectCard()* operation is completed an *OperationCompleteEvent* event will be sent by the Device Control to all registered OperationCompleteListeners with the following data:

Field	**Value**
operationID	JXFS_O_MOTOR_EJECTCARD
identificationID	The corresponding Id.
Result	JXFS_RC_SUCCESSFUL Operation completed successfully. This implies that the media has been presented. JXFS_E_CANCELLED Operation was cancelled. JXFS_E_MOTOR_MEDIAJAMMED Media is jammed. JXFS_E_MOTOR_SHUTTERFAIL Shutter could not be opened. JXFS_E_MOTOR_NOMEDIA There is no media to eject.
data:	null.

StatusEvent
A StatusEvent can be sent by the Device Control to all registered StatusListeners

Field	**Value**
status	JXFS_S_MEDIA_STATUS
details	JxfsMediaStatus mediaStatus The new media status of the device.

Exceptions No additional exceptions are generated. See section on JxfsExceptions for common value codes.

retainCard Method

Syntax ***identificationID retainCard () throws JxfsException;***

Description Retains card.

Event **OperationCompleteEvent**
When a *retainCard()* operation is completed an *OperationCompleteEvent* event will be sent by the Device Control to

all registered OperationCompleteListeners.

Field	**Value**
OperationID	JXFS_O_MOTOR_RETAINCARD
IdentificationID	The corresponding Id.
Result	JXFS_RC_SUCCESSFUL Operation completed successfully. JXFS_E_CANCELLED Operation was cancelled. JXFS_E_MOTOR_BINFULL Retain bin is full. JXFS_E_MOTOR_MEDIAJAMMED Media is jammed. JXFS_E_MOTOR_NOMEDIA There is no media to retain.
data	null

StatusEvent

A StatusEvent can be sent by the Device Control to all registered StatusListeners

Field	**Value**
status	JXFS_S_MEDIA_STATUS
details	JxfsMediaStatus mediaStatus The new media status of the device.

Exceptions No additional exceptions are generated. See section on JxfsExceptions for common value codes.

4.6 IJxfsMSDSecure

4.6.1 Introduction

This interface contains properties and functions that may be supported in motorized card MSD devices with a security box instaled.

It is intended that this interface will be implemented by device controls that represent physical devices with the security feature.

Summary

Although IJxfsMSDSecure is an interface, and therefore properties do not apply, properties are detailed here with the objective to provide guidance in the implementation of those classes that will implement this interface.

Therefore, the IJxfsMSDSecure consists on the following methods:

- Getters of listed properties.
- Methods listed.

Property	Type	Access	Initialized after
secureModuleKey	byte [ ]	R/W	
secureModuleStatus	int	R	

Method	Return	May be used after
get*Property*	*Property*	
set*Property*	*void*	
readData	identificationID	
readWMtrack	identificationID	

4.6.2 Properties

secureModuleKey Property (R/W)

Type	***byte [ ]***
Initial Value	Null
Description	Contains the secure module key with parity. Its value should be introduced once and be kept after power off.

secureModuleStatus Property (R)

Type	***Int***
Initial Value	Depends on device at open.
Description	Indicates the status of the security module, if any.

Value	**Meaning**
JXFS_S_MSD_SEC_READY	Security module ready.
JXFS_S_MSD_SEC_NOTREADY	Security module not ready.
JXFS_S_MSD_SEC_UNKNOWN	State of the security module cannot be determined with the device in its current state.

Event If the value of this property changes, the Device Service will send all registered StatusListeners a StatusEvent with a status value of:

Field	**Value**
status	JXFS_S_MSD_SEC_STATUS *secureModuleStatus* has changed.
details	None.

4.6.3 Methods

readData Method

Syntax ***identificationID readData (JxfsMSDTrackSelection tracksToRead, JxfsMSDSecureMode secureMode) throws JxfsException;***

Description This method overloads the normal readData method.

It launches a read operation to obtain the data contained in the tracks specified by the *tracksToRead* parameter.

If media is present, the read operation is performed immediately. Otherwise, the device waits until it is present or the operation is cancelled.
After a successful completion of this input operation, an *OperationCompleteEvent* event is issued to inform the application of the results.

Parameter

Type	**Name**	**Meaning**
JxfsMSDTracksSelection	tracksToRead	Tracks to be read.
JxfsMSDSecureMode	SecureMode	Required settings for secure operation.

Event **OperationCompleteEvent**
When a *readData ()* operation is completed an *OperationCompleteEvent* event will be sent by MSD Device Control to all registered OperationCompleteListeners. It will contain the data read.

Field	**Value**
operationID	JXFS_O_MSD_READDATA
identificationID	Identification ID of complete operation.
result	JXFS_RC_SUCCESSFUL Operation completed successfully. JXFS_E_CANCELLED Operation was cancelled. JXFS_E_MSD_READFAILURE No read conditions were satisfied (that is, not all tracks specified in *tracksToRead* parameter have been read). It is possible, however, that some tracks could be read. Check *data* object for extended information on tracks actually read. JXFS_E_MSD_NOMEDIA Media was removed before operation completion JXFS_E_MSD_INVALIDMEDIA No appropriated media was found. JXFS_E_MSD_MEDIAJAMMED Media is jammed. JXFS_E_MSD_SHUTTERFAIL Shutter could not be opened.
data	A **JxfsMSDReadDataSecure** object.

IntermediateEvent
IntermediateEvent can be sent by MSD Device Control to all registered IntermediateListeners

Field	**Value**
operationID	JXFS_O_MSD_READDATA
identificationID	Identification ID of operation.

reason	JXFS_I_MSD_NO_MEDIA_PRESENT The read operation request cannot progress because there is no media inserted. JXFS_I_MSD_MEDIA_INSERTED The read operation request continues because a media has been inserted.
data	null

Exceptions

Some possible JxfsException *value codes*. See section on JxfsExceptions for other JxfsException value codes.

Value	Meaning
JXFS_E_MSD_NOTSUPPORTEDTRACK	At least one track specified in *tracksToRead* parameter is not supported by the device.
JXFS_E_MSD_NOTRACKS	No tracks specified in *tracksToRead* parameter.
JXFS_E_MSD_NOTSUPPORTEDCAP	The service does not have secure capability.

readWMtrack

Syntax ***identificationID readWMtrack () throws JxfsException;***

Description

This method launches a read operation to obtain the data contained in the Watermark.

If media is present, the read operation is performed immediately. Otherwise, the device waits until it is present or the operation is cancelled.

After a successful completion of this input operation, an *OperationCompleteEvent* event is issued to inform the application of the results.

Event

OperationCompleteEvent

When a *readData ()* operation is completed an *OperationCompleteEvent* event will be sent by MSD Device Control to all registered OperationCompleteListeners. It will contain the data read.

Field	Value
operationID	JXFS_O_MSD_READDATA
identificationID	Identification ID of complete operation.
result	JXFS_RC_SUCCESSFUL Operation completed successfully. JXFS_E_CANCELLED Operation was cancelled. JXFS_E_MSD_READFAILURE No read conditions were satisfied. JXFS_E_MSD_NOMEDIA Media was removed before operation completion JXFS_E_MSD_INVALIDMEDIA No appropriated media was found. JXFS_E_MSD_MEDIAJAMMED Media is jammed. JXFS_E_MSD_SHUTTERFAIL Shutter could not be opened.
data	A **JxfsMSDWmData** with Watermark data.

Exceptions

Some possible JxfsException *value codes*. See section on JxfsExceptions for other JxfsException value codes.

Value	**Meaning**
JXFS_E_MSD_NOTSUPPORTEDTRACK	Watermark is not supported.

5 Support Classes

5.1 JxfsMSDTracks

This class provides properties and methods to query which tracks of a MSD device have been selected, are active or have been written.

Used by readData method.

Summary

Implements : -- **Extends :** **JxfsType**

Property	Type	Access	Initialized after
track1	boolean	R	
track2	boolean	R	
track3	boolean	R	

Method	Return	May use after
is*Property*	*Property*	
allTracks	boolean	
noTracks	boolean	
JxfsMSDTracks (boolean track1, boolean track2, boolean track3)	(constructor of the class)	

5.1.1 Properties

track1 Property (R)

Type	***boolean***	
Initial Value	FALSE	
Description	Indicates if track1 is selected.	
	Value	**Meaning**
	FALSE	Track1 is not selected.
	TRUE	Track1 is selected.

track2 Property (R)

Type	***boolean***	
Initial Value	FALSE	
Description	Indicates if track2 is selected.	
	Value	**Meaning**
	FALSE	Track2 is not selected.
	TRUE	Track2 is selected.

track3 Property (R)

Type	***boolean***	
Initial Value	FALSE	
Description	Indicates if track3 is selected.	
	Value	**Meaning**
	FALSE	Track3 is not selected.
	TRUE	Track3 is selected.

5.1.2 Methods

isTrack1 .. isTrack3 Methods

Syntax	***boolean isTrack1 () .. boolean isTrack3 ()***
Description	Return TRUE if specific track property is set to TRUE.

allTracks Method

Syntax	***boolean allTracks ()***
Description	Returns TRUE if all tracks (*track1, track2* and *track3*) are set to TRUE.

noTracks Method

Syntax	***boolean noTracks ()***
Description	Returns TRUE if all tracks (*track1, track2* and *track3*) are set to FALSE.

JxfsMSDTracks Constructor

Syntax	***JxfsMSDTracks (boolean track1, boolean track2, boolean track3)***
Description	Constructor of the class.

5.2 JxfsMSDTrackSelection

This class provides properties and methods to query and select the active tracks of a MSD device.

Summary

Implements :	**--**	**Extends :**	**JxfsMSDTracks**

Property	Type	Access	Initialized after
No additional properties.			

Method	Return	May use after
set*Property*	void	
setAllTracks	void	
setNoTracks	void	
JxfsMSDTrackSelection (boolean track1, boolean track2, boolean track3)	(constructor of the class)	

5.2.1 Properties

No additional properties to those inherited from base class *JxfsMSDTracks*.

5.2.2 Methods

setTrack1 .. setTrack3 Methods

Syntax	***void setTrack1 () .. void setTrack3 ()***
Description	Set specific track property to TRUE.

setAllTracks Method

Syntax	***void setAllTracks ()***
Description	Sets all tracks (*track1, track2 and track3* properties) to TRUE.

setNoTracks Method

Syntax	***void setNoTracks ()***
Description	Sets all tracks (*track1, track2 and track3* properties) to FALSE.

JxfsMSDTrackSelection Constructor

Syntax	***JxfsMSDTrackSelection (boolean track1, boolean track2, boolean track3)***
Description	Constructor of the class.

5.3 JxfsMSDReadData

This class contains the data returned by an *OperationCompleteEvent* event for *readData()* operation.

Summary

Implements : -- **Extends :** **JxfsType**

Property	Type	Access	Initialized after
DataRead	**java.util.Vector**	R	
tracksRead	**JxfsMSDTracks**	R	
resultReadTrack1	**int**	R	
resultReadTrack2	**int**	R	
resultReadTrack3	**int**	R	

Method	Return	May use after
get*Property*	*Property*	
JxfsMSDReadData (java.util.Vector dataRead, JxfsMSDTracks tracksRead, int resultReadTrack1, int resultReadTrack2, int resultReadTrack3)	(constructor of the class)	

5.3.1 Properties

dataRead Property (R)

Type	***java.util.Vector***
Description	Vector of three byte [ ]. Each one contains the raw data read from a track. Vector element 0 contains data for track 1, vector element 1 contains data for track 2, and so on. If no data has been read for a given track, the corresponding vector element contains **null**. The track data has no hardware control characters or BCC included (like SS, SE, or BCC). The data for ISO track #1 (6 bits per character) is transformed in the range of 0x20 to 0x5F and the data for the ISO tracks #2 and #3 (4 bits per character) are transformed in the range from 0x30 to 0x3F.

tracksRead Property (R)

Type	***JxfsMSDTracks***
Description	Indicates which tracks were effectively read.

resultReadTrack1, resultReadTrack2, resultReadTrack3 Properties (R)

Type	***Int***
Initial Value	Depends on device type.
Description	Holds the error code resulting from the read operation for the tracks that could not be read. Should be consulted when a global read error

JXFS_E_MSD_READFAILURE has been reported.
Applications must not rely on specific error codes since these may depend on the specific device for a given faulty card.
They will be set with one of the following values:

Value	**Meaning**
JXFS_E_MSD_NOTSUPPORTEDTRACK	Track not supported by device.
JXFS_E_MSD_READFAILURE	Read error on track.
JXFS_E_MSD_PARITY	Parity read error.
JXFS_E_MSD_READ_EOF	Only SS,SE,BCC on track.
JXFS_E_MSD_NO_STRIPE	No magnetic stripe or flux on stripe detected (if device has capability to detect this situation).
JXFS_E_MSD_READ_OTHER	Any other type of error.

5.3.2 Methods

JxfsMSDReadData Constructor

Syntax ***JxfsMSDReadData (java.util.Vector dataRead, JxfsMSDTracks tracksRead, int resultReadTrack1, int resultReadTrack2, int resultReadTrack3)***

Description Constructor of the class.

5.4 JxfsCCDData

This class contains the data returned by an *OperationCompleteEvent* event for *chipInit*() and *ChipIO( )* operations.

Summary

Implements : **--** **Extends :** **JxfsType**

Property	Type	Access	Initialized after
chipData	**byte[ ]**	R	

Method	Return	May use after
get*Property*	*Property*	
JxfsCCDData (byte[ ] chipData)	(constructor of the class)	

5.4.1 Properties

chipData Property (R)

Type	***byte[]***
Description	Contains the data returned by the chip card after a successfull completion of an I/O operation. If operation completed is *chipInit()* , then it contains the ATR data from the chip. If operation completed is *chipIO()* , then it contains the data replied by the chip.

5.4.2 Methods

JxfsCCDData Constructor

Syntax	***JxfsCCDData (byte[ ] chipData)***
Description	Constructor of the class.

5.5 JxfsMSDWmData

This class contains the data returned by an *OperationCompleteEvent* event for *readWMtrack()* operation.

Summary

Implements :	**--**	**Extends :**	**JxfsType**

Property	Type	Access	Initialized after
wmData	**byte[ ]**	R	

Method	Return	May use after
get*Property*	*Property*	
JxfsMSDWmData (byte[ ] wmData)	(constructor of the class)	

5.5.1 Properties

wmData Property (R)

Type	***byte[]***
Description	Contains the raw Watermark data read

5.5.2 Methods

JxfsMSDWmData Constructor

Syntax	***JxfsMSDWmData (byte[ ] wmData)***
Description	Constructor of the class.

5.6 JxfsMSDSecureMode

This class provides required properties for *readData()* operation in secure mode.

Summary

Implements : -- **Extends : JxfsType**

Property	Type	Access	Initialized after
securityCheck	boolean	R/W	
secureTestCard	boolean	R/W	

Method	Return	May be used after
is*Property*	*Property*	
set*Property*	*void*	
JxfsMSDSecureMode (boolean securityCheck, boolean secureTestCard)	(constructor of the class)	

5.6.1 Properties

securityCheck Property (R/W)

Type	***boolean***	
Initial Value	FALSE	
Description	Indicates whether a security check has to be requested in read operation. Since the overloaded method will normally be used when security check is desired, this property will usually be TRUE.	
	Value	**Meaning**
	TRUE	Security check requested.
	FALSE	No security check requested.

securityTestCard Property (R/W)

Type	***boolean***	
Initial Value	FALSE	
Description	Indicates whether the card to be read is an ecCard or a Test Card.	
	Value	**Meaning**
	TRUE	Test card to be read.
	FALSE	Normal card to be read.

5.6.2 Methods

JxfsMSDSecureMode Constructor

Syntax	***JxfsMSDSecureMode (boolean securityCheck, boolean secureTestCard)***
Description	Constructor of the class.

5.7 JxfsMSDReadDataSecure

This class contains the data returned by an *OperationCompleteEvent* event for *readData()* method in secure mode.

Summary

Implements : -- **Extends :** **JxfsType**

Property	Type	Access	Initialized after
readData	**JxfsMSDReadData**	R	
securityInfo	int	R	
testResult	byte	R	
cim86Info	byte [8]	R	

Method	Return	May be used after
get*Property*	*Property*	
JxfsMSDReadDataSecure (JxfsMSDReadData readData, int securityInfo, byte testResult, byte[ ] cim86Info)	(constructor of the class)	

5.7.1 Properties

readData Property (R)

Type *JxfsMSDReadData*

Description This class contains the data obtained from *readData()* operation as in the unsecure mode. *See JxfsMSDReadData* class for details.

securityInfo Property (R)

Type *int*

Description Indicates the result of the security check in the read operation, that could be one of the following values:

Value	**Meaning**
JXFS_MSD_SEC_NOCHECK	No security check was requested.
JXFS_MSD_SEC_NOTREADY	Security module was not ready.
JXFS_MSD_SEC_SECFAIL	Security module failed reading media security sign.
JXFS_MSD_SEC_SECOK	Successful security check.

testResult Property (R)

Type *byte*

Description Holds the test result for a given test card. See CIM-86 specifications.

cim86Info Property (R)

Type *byte[8]*

Description Contains detailed result of the security check in the read operation for CIM-86 modules. See CIM-86 specifications.

5.7.2 Methods

JxfsMSDReadDataSecure Constructor

Syntax	***JxfsMSDReadDataSecure (JxfsMSDReadData readData, int securityInfo, byte testResult, byte[ ] cim86Info)***
Description	Constructor of the class.

6 Codes

6.1 Error Codes

Value	Meaning
JXFS_E_MSD_READFAILURE	No read conditions were satisfied (that is, not all tracks specified in *tracksToRead* parameter have been read or no Watermark was read).
JXFS_E_MSD_NOMEDIA	Media was removed before operation completion.
JXFS_E_MSD_INVALIDMEDIA	No appropriated media was found.
JXFS_E_MSD_MEDIAJAMMED	Media is jammed.
JXFS_E_MSD_SHUTTERFAIL	Shutter could not be opened.
JXFS_E_MSD_NOTSUPPORTED TRACK	At least one track specified in *tracksToRead* parameter is not supported by the device.
JXFS_E_MSD_NOTRACKS	No tracks specified in *tracksToRead* parameter.
JXFS_E_MSD_WRITEFAILURE	No write conditions were satisfied.
JXFS_E_MSD_BADDATA	Data is invalid.
JXFS_E_MSD_NOTSUPPORTED CAP	The service does not have secure capability.
JXFS_E_MSD_PARITY	Parity read error.
JXFS_E_MSD_READ_EOF	Only SS,SE,BCC on track.
JXFS_E_MSD_NO_STRIPE	No magnetic stripe or flux on stripe detected (if device has capability to detect this situation).
JXFS_E_MSD_READ_OTHER	Any other type of read error.

Value	Meaning
JXFS_E_CCD_IOERROR	IO error occurred. No ATR data is available.
JXFS_E_CCD_NOMEDIA	Media was removed before operation completion.
JXFS_E_CCD_INVALIDMEDIA	No appropriated media was found.
JXFS_E_CCD_MEDIAJAMMED	Media is jammed.
JXFS_E_CCD_SHUTTERFAIL	Shutter could not be opened.
JXFS_E_CCD_BADDATA	Chip reported data was bad.
JXFS_E_CCD_BADPROTOCOL	Protocol not supported.

Value	Meaning
JXFS_E_MOTOR_MEDIAJAMMED	Media is jammed.
JXFS_E_MOTOR_SHUTTERFAIL	Shutter could not be opened.
JXFS_E_MOTOR_NOMEDIA	There is no media to eject.
JXFS_E_MOTOR_BINFULL	Retain bin is full.

6.2 Status Codes

Value	Meaning
JXFS_S_MSD_MEDIA_STATUS	*mediaStatus* property has changed.

Value	Meaning
JXFS_S_CCD_MEDIA_STATUS	*mediaStatus* property has changed.

Value	Meaning
JXFS_S_MOTOR_BIN_STATUS	*retainBinStatus* property has changed.
JXFS_S_MOTOR_BIN_CARDRE TAINED	*retainCardCount* property has incremented.

Value	Meaning
JXFS_S_MSD_SEC_STATUS	*secureModuleStatus* property has changed.
JXFS_S_MSD_SEC_READY	Security module ready.
JXFS_S_MSD_SEC_NOTREADY	Security module not ready.
JXFS_S_MSD_SEC_UNKNOWN	State of the security module cannot be determined with the device in its current state.

6.3 Operation Codes

The following codes identify the operation that generated an OperationCompleteEvent or IntermediateEvent:

Value	Method
JXFS_O_MSD_READDATA	*readData, readWMtrack*
JXFS_O_MSD_WRITEDATA	*writeData*

Value	Method
JXFS_O_CCD_CHIPINIT	*chipInit*
JXFS_O_CCD_CHIPIO	*chipIO*

Value	Method
JXFS_O_MOTOR_EJECTCARD	*ejectCard*
JXFS_O_MOTOR_RETAINCARD	*retainCard*

The following codes identify the reason for an IntermediateEvent:

Value	Meaning
JXFS_I_MSD_NO_MEDIA_PRESENT	The read operation request cannot progress because there is no media inserted.
JXFS_I_MSD_MEDIA_INSERTED	The read operation request continues because a media has been inserted.

Value	Meaning
JXFS_I_CCD_NO_MEDIA_PRESENT	The read operation request cannot progress because there is no media inserted.
JXFS_I_CCD_MEDIA_INSERTED	The read operation request continues because a media has been inserted.

6.4 Constants

Value	Meaning
JXFS_MSD_TYPE_SWIPE = 1	Swipe/pull through magnetic stripe reader/encoder.
JXFS_MSD_TYPE_DIP = 2	Dip magnetic card reader/encoder.
JXFS_MSD_TYPE_MOTOR = 4	Motorized card reader.
JXFS_MSD_SECTYPE_NOTSUPPORTED	No security module available.
JXFS_MSD_SECTYPE_MMBOX	MMBox module available.
JXFS_MSD_SECTYPE_CIM86	CIM86 module available.

Value	Meaning
JXFS_CCD_TYPE_SWIPE = 1	Swipe/pull through chip card device.
JXFS_CCD_TYPE_DIP = 2	Dip chip card device.
JXFS_CCD_TYPE_MOTOR = 4	Motorized chip card device.
JXFS_CCD_TYPE_CONTACTLESS = 8	Contactless chip card device.

Value	Meaning
JXFS_MOTOR_EJECT	At power off /on card is ejected.
JXFS_MOTOR_EJECT_THEN_RETAIN	At power off /on card is ejected, then, after some seconds, it is retained.
JXFS_MOTOR_NOACTION	At power off /on no action is taken.
JXFS_MOTOR_READ_POSITION	At power off /on card is brought to the read/write position.
JXFS_MOTOR_RETAIN	At power off /on card is retained.

Value	Meaning
JXFS_MSD_SEC_NOCHECK	No security check was requested.
JXFS_MSD_SEC_NOTREADY	Security module was not ready.
JXFS_MSD_SEC_SECFAIL	Security module failed reading media security sign.
JXFS_MSD_SEC_SECOK	Successful security check.

7 Device Service Interface Methods

The Device Service interface is common to all device services of this device type. It is used by the Device Controls to access the functionality of the device. This interface has to be implemented by any J/XFS Device Service.
The device type specific Device Service interface is similar to the Device Control interface. All device specific method calls are extended by an additional parameter (int control_id). This is always added as the last parameter in every operation.

8 APPENDIX A: CEN/ISSS WORKSHOP 14923:2004 CORE MEMBERS :

DELARUE

DIEBOLD

DYNASTY

IBM

KAL

KEBA

LUTZ WOLF GRUPPE

NCR

NEXUS

SEIKO EPSON CORPORATION

WINCOR - NIXDORF

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