

# Package com.sun.javacard.apduio

Provides a client API for exchanging APDUs with smart cards.

See:  
[Description](#)

Interface Summary	
<a href="#">CadClientInterface</a>	An interface describing a client connection to a card.

Class Summary	
<a href="#">Apu</a>	This class represent a pair of C-APDU and R-APDU.
<a href="#">CadDevice</a>	Factory class producing CardClientInterface instances (connections to a card)

Exception Summary	
<a href="#">CadTransportException</a>	This abstract class is the parent class of all CAD exception classes.
<a href="#">T1Exception</a>	This class represents error states for T=1 CAD devices.
<a href="#">TLP224Exception</a>	Exceptions related to TLP224 protocol violations

# Package com.sun.javacard.apduio Description

Provides a client API for exchanging APDUs with smart cards.

It is used internally by several components of the Java Card development kit.

com.sun.javacard.apduio

Class Apdu

java.lang.Object

└─ com.sun.javacard.apduio.Apdu

public class Apdu

extends java.lang.Object

This class represent a pair of C-APDU and R-APDU. It is used internally by several components of the Java Card development kit.

Field Summary	
static int	<a href="#">APDU_TYPE_MASK</a> Mask to extract APDU type information: either ISO ecoding or not.
static int	<a href="#">CASE_1</a> The value which indicates this Apdu is an ISO 7816-3 Case 1 apdu
static int	<a href="#">CASE_2E</a> The value which indicates this Apdu is an ISO 7816-3 Case 2 Extended apdu
static int	<a href="#">CASE_2S</a> The value which indicates this Apdu is an ISO 7816-3 Case 2 Short apdu
static int	<a href="#">CASE_3E</a> The value which indicates this Apdu is an ISO 7816-3 Case 3 Extended apdu
static int	<a href="#">CASE_3S</a> The value which indicates this Apdu is an ISO 7816-3 Case 3 Short apdu

static int	<a href="#"><u>CASE_4E</u></a> The value which indicates this Apdu is an ISO 7816-3 Case 4 Extended apdu
static int	<a href="#"><u>CASE_4S</u></a> The value which indicates this Apdu is an ISO 7816-3 Case 4 Short apdu
static int	<a href="#"><u>CLA</u></a> The offset in the command array to the ISO 7816-3 CLA octet.
byte[]	<a href="#"><u>command</u></a> Internal representation of the C-APDU header
byte[]	<a href="#"><u>dataIn</u></a> Data part of the C-APDU
byte[]	<a href="#"><u>dataOut</u></a> Data part of the R-APDU
static int	<a href="#"><u>INS</u></a> The offset in the command array to the ISO 7816-3 INS octet.
boolean	<a href="#"><u>isExtended</u></a> Extended APDU flag
int	<a href="#"><u>Lc</u></a> Value of Lc
int	<a href="#"><u>Le</u></a> Value of Le
static int	<a href="#"><u>LOGICAL_CHN_MASK</u></a> Mask to extract channel information out of the CLA byte.
static int	<a href="#"><u>P1</u></a> The offset in the command array to the ISO 7816-3 P1 octet.
static int	<a href="#"><u>P2</u></a> The offset in the command array to the ISO 7816-3 P2 octet.
static int	<a href="#"><u>P3</u></a> The offset in the command array to the ISO 7816-3 P3 octet.
byte[]	<a href="#"><u>sw1sw2</u></a> Status as byte array

## Constructor Summary

[Apdu](#)( )

Creates a new instance of Apdu.

## Method Summary

int	<a href="#"><u>getCase</u></a> ( ) Return the ISO 7816-3 Case of this Apdu
byte	<a href="#"><u>getChannelInfo</u></a> ( ) Determines the channel number
byte [ ]	<a href="#"><u>getCommand</u></a> ( ) Get internal representation of the header of the C-APDU
byte [ ]	<a href="#"><u>getCommandApduBytes</u></a> ( ) returns the command APDU as a byte array.
byte [ ]	<a href="#"><u>getDataIn</u></a> ( ) Get the data part of the C-APDU
byte [ ]	<a href="#"><u>getDataOut</u></a> ( ) Get the data part of the R-APDU
int	<a href="#"><u>getLc</u></a> ( ) Get Lc
int	<a href="#"><u>getLe</u></a> ( ) Get Le
byte [ ]	<a href="#"><u>getResponseApduBytes</u></a> ( ) returns the response APDU as a byte array.
int	<a href="#"><u>getStatus</u></a> ( ) Get status (SW bytes) as integer
byte [ ]	<a href="#"><u>getSw1Sw2</u></a> ( ) Get status bytes
void	<a href="#"><u>setDataIn</u></a> (byte[ ] dataIn) Set the data of the C-APDU
void	<a href="#"><u>setDataIn</u></a> (byte[ ] dataIn, int length) Set the data of the C-APDU
void	<a href="#"><u>setDataOut</u></a> (byte[ ] dataOut) Set the data part of the R-APDU

void	<a href="#"><code>setDataOut</code></a> (byte[] dataOut, int length) Set the data part of the R-APDU
void	<a href="#"><code>setLc</code></a> (int Lc) Set the value of Lc
void	<a href="#"><code>setLe</code></a> (int Le) Set Le
java. lang. String	<a href="#"><code>toString</code></a> () Generate a string representation of this Apm in the ApmTool output format.

<b>Methods inherited from class java.lang.Object</b>
clone, equals, finalize, getClass, hashCode, notify, notifyAll, wait, wait, wait

## Field Detail

### CLA

public static final int **CLA**

The offset in the command array to the ISO 7816-3 CLA octet.

**See Also:**  
[Constant Field Values](#)

### INS

public static final int **INS**

The offset in the command array to the ISO 7816-3 INS octet.

**See Also:**  
[Constant Field Values](#)

---

## P1

```
public static final int P1
```

The offset in the command array to the ISO 7816-3 P1 octet.

**See Also:**

[Constant Field Values](#)

---

## P2

```
public static final int P2
```

The offset in the command array to the ISO 7816-3 P2 octet.

**See Also:**

[Constant Field Values](#)

---

## P3

```
public static final int P3
```

The offset in the command array to the ISO 7816-3 P3 octet.

**See Also:**

[Constant Field Values](#)

---

## CASE\_1

```
public static final int CASE_1
```

The value which indicates this Apdu is an ISO 7816-3 Case 1 apdu

**See Also:**

[Constant Field Values](#)

---

## **CASE\_2S**

```
public static final int CASE_2S
```

The value which indicates this Apdu is an ISO 7816-3 Case 2 Short apdu

**See Also:**

[Constant Field Values](#)

---

## **CASE\_3S**

```
public static final int CASE_3S
```

The value which indicates this Apdu is an ISO 7816-3 Case 3 Short apdu

**See Also:**

[Constant Field Values](#)

---

## **CASE\_4S**

```
public static final int CASE_4S
```

The value which indicates this Apdu is an ISO 7816-3 Case 4 Short apdu

**See Also:**

[Constant Field Values](#)

---

## **CASE\_2E**

```
public static final int CASE_2E
```

The value which indicates this Apdu is an ISO 7816-3 Case 2 Extended apdu

**See Also:**

[Constant Field Values](#)

---

## **CASE\_3E**

```
public static final int CASE_3E
```

The value which indicates this Apdu is an ISO 7816-3 Case 3 Extended apdu

**See Also:**

[Constant Field Values](#)

---

## **CASE\_4E**

```
public static final int CASE_4E
```

The value which indicates this Apdu is an ISO 7816-3 Case 4 Extended apdu

**See Also:**

[Constant Field Values](#)

---

## **LOGICAL\_CHN\_MASK**

```
public static final int LOGICAL_CHN_MASK
```

Mask to extract channel information out of the CLA byte.

**See Also:**

[Constant Field Values](#)



---

## APDU\_TYPE\_MASK

```
public static final int APDU_TYPE_MASK
```

Mask to extract APDU type information: either ISO ecoding or not.

**See Also:**

[Constant Field Values](#)

---

## command

```
public byte[] command
```

Internal representation of the C-APDU header

---

## Lc

```
public int Lc
```

Value of Lc

---

## dataIn

```
public byte[] dataIn
```

Data part of the C-APDU

---

## Le

```
public int Le
```

Value of Le

---

## **dataOut**

```
public byte[] dataOut
```

Data part of the R-APDU

---

## **sw1sw2**

```
public byte[] sw1sw2
```

Status as byte array

---

## **isExtended**

```
public boolean isExtended
```

Extended APDU flag

## **Constructor Detail**

### **Apdu**

```
public Apdu()
```

Creates a new instance of Apdu.

## **Method Detail**

### **getCommand**

```
public byte[] getCommand()
```

Get internal representation of the header of the C-APDU

**Returns:**

The header of the C-APDU

---

## **getDataIn**

```
public byte[] getDataIn()
```

Get the data part of the C-APDU

**Returns:**

The data

---

## **setDataIn**

```
public void setDataIn(byte[] dataIn)
```

Set the data of the C-APDU

**Parameters:**

dataIn - The data

---

## **setLc**

```
public void setLc(int Lc)
```

Set the value of Lc

**Parameters:**

Lc - value of the Lc

---

## setDataIn

```
public void setDataIn(byte[] dataIn,  
                      int length)
```

Set the data of the C-APDU

### Parameters:

dataIn - The data

length - the data length

---

## getLc

```
public int getLc()
```

Get Lc

### Returns:

The Lc

---

## setDataOut

```
public void setDataOut(byte[] dataOut)
```

Set the data part of the R-APDU

### Parameters:

dataOut - The data

---

## setLe

```
public void setLe(int Le)
```

Set Le

**Parameters:**

Le - value of Le

---

## setDataOut

```
public void setDataOut(byte[] dataOut,  
                        int length)
```

Set the data part of the R-APDU

**Parameters:**

dataOut - The data

length - The data length

---

## getLe

```
public int getLe()
```

Get Le

**Returns:**

The Le

---

## getDataOut

```
public byte[] getDataOut()
```

Get the data part of the R-APDU

**Returns:**

The data part of the R-APDU

---

## getSw1Sw2

```
public byte[] getSw1Sw2()
```

Get status bytes

**Returns:**

The status bytes

---

## getStatus

```
public int getStatus()
```

Get status (SW bytes) as integer

**Returns:**

The status

---

## getCase

```
public int getCase()
```

Return the ISO 7816-3 Case of this Apdu

**Returns:**

An int value indicating the ISO case.

---

## getChannelInfo

```
public byte getChannelInfo()
```

Determines the channel number

**Returns:**

The channel number

---

## getCommandAduBytes

```
public byte[] getCommandAduBytes()
```

returns the command APDU as a byte array.

**Returns:**

The command APDU

---

## getResponseAduBytes

```
public byte[] getResponseAduBytes()
```

returns the response APDU as a byte array.

**Returns:**

The response APDU

---

## toString

```
public java.lang.String toString()
```

Generate a string representation of this Adu in the AduTool output format.

**Overrides:**

`toString` in class `java.lang.Object`

**Returns:**

String representation of this Adu

---





com.sun.javacard.apduio

Interface CadClientInterface

public interface CadClientInterface

An interface describing a client connection to a card.

Method Summary	
void	<a href="#">exchangeApdu</a> ( <a href="#">Apdu</a> apdu) Exchanges com.sun.javacard.apduio.Apdu with a card.
void	<a href="#">powerDown</a> ( ) Powerdown a card or simulator and then disconnect
void	<a href="#">powerDown</a> (boolean disconnect) Send powerdown to a card
byte [ ]	<a href="#">powerUp</a> ( ) Send powerup to a card or a simulator

Method Detail

exchangeApdu

void **exchangeApdu**([Apdu](#) apdu)  
throws java.io.IOException,  
[CadTransportException](#)

Exchanges com.sun.javacard.apduio.Apdu with a card.

**Parameters:**

apdu - A pair of C-APDU and R-APDU

**Throws:**

`java.io.IOException` - Communication error

[`CadTransportException`](#) - Protocol error

---

## powerDown

```
void powerDown(boolean disconnect)
    throws java.io.IOException,
           CadTransportException
```

Send powerdown to a card

**Parameters:**

disconnect - This parameter is applicable to card simulators only. true = disconnect from the simulator false = poweredown, but leave the connection open

**Throws:**

`java.io.IOException` - Communication error

[`CadTransportException`](#) - Protocol error

---

## powerDown

```
void powerDown( )
    throws java.io.IOException,
           CadTransportException
```

Powerdown a card or simulator and then disconnect

**Throws:**

`java.io.IOException` - Communication error

[`CadTransportException`](#) - Protocol error

---

## powerUp

```
byte[] powerUp()  
    throws java.io.IOException,  
           CadTransportException
```

Send powerup to a card or a simulator

**Returns:**

ATR bytes

**Throws:**

[java.io.IOException](#) - Communication error

[CadTransportException](#) - Protocol error

---

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DETAIL: FIELD | CONSTR | [METHOD](#)

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com.sun.javacard.apduio  
**Class CadDevice**

java.lang.Object  
└─ com.sun.javacard.apduio.CadDevice

public abstract class **CadDevice**

extends java.lang.Object

Factory class producing CardClientInterface instances (connections to a card)

**Field Summary**

protected static java.util.ResourceBundle	<a href="#">messages</a> Properties file with messages
protected boolean	<a href="#">debug</a> Internal debug flag.
protected byte	<a href="#">deviceProtocol</a> The currenty used protocol
protected java.io.InputStream	<a href="#">in</a> The input stream which data is read from.
protected java.io.OutputStream	<a href="#">out</a> The output stream to which data is written.
static byte	<a href="#">PROTOCOL_PCSC</a> PC/SC constant
static byte	<a href="#">PROTOCOL_T0</a> Protocol constant
static byte	<a href="#">PROTOCOL_T1</a> Protocol constant

static byte	<a href="#">PROTOCOL_TCL</a> Protocol constant
-------------	---

## Constructor Summary

protected	<a href="#">CadDevice</a> (byte devProtocolType) this form of constructor is used by PCSC streams are not applicable
protected	<a href="#">CadDevice</a> (byte devProtocolType, java.io.InputStream in, java.io.OutputStream out) this form of constructor is used by T=0, T=1 implementations

## Method Summary

void	<a href="#">close</a> () Flush and close the input and output streams.
static <a href="#">CadClientInterface</a>	<a href="#">getCadClientInstance</a> (byte protocolType, java.io.InputStream in, java.io.OutputStream out) A factory method
byte	<a href="#">getDeviceProtocol</a> () Get the value of the protocol byte
static <a href="#">CadClientInterface</a>	<a href="#">getPCSCClientInstance</a> (int readerNumber) A factory method for connecting to a PCSC card readed

## Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

## Field Detail

### **`_messages`**

protected static java.util.ResourceBundle **`_messages`**

Properties file with messages

### **`in`**

protected java.io.InputStream **`in`**

The input stream which data is read from. This field is used to store the reference to the input stream which an instance of the Cad class reads from.

---

## out

```
protected java.io.OutputStream out
```

The output stream to which data is written. This field is used to store the reference to the output stream which an instance of the Cad class writes to.

---

## debug

```
protected boolean debug
```

Internal debug flag. Set the system property apduIODebug to 0x01 to activate transport level debugging.

---

## PROTOCOL\_T0

```
public static final byte PROTOCOL_T0
```

Protocol constant

**See Also:**

[Constant Field Values](#)

---

## PROTOCOL\_T1

```
public static final byte PROTOCOL_T1
```

Protocol constant

**See Also:**

[Constant Field Values](#)

---

## PROTOCOL\_TCL

public static final byte **PROTOCOL\_TCL**

Protocol constant

**See Also:**

[Constant Field Values](#)

---

## PROTOCOL\_PCSC

public static final byte **PROTOCOL\_PCSC**

PC/SC constant

**See Also:**

[Constant Field Values](#)

---

## deviceProtocol

protected byte **deviceProtocol**

The currenty used protocol

## Constructor Detail

### CadDevice

```
protected CadDevice(byte devProtocolType,  
                    java.io.InputStream in,  
                    java.io.OutputStream out)
```

this form of constructor is used by T=0, T=1 implementations

**Parameters:**

devProtocolType - Procol constant: T1 or T1

in - Input stream from a simulator or a TLP224 card reader

out - Output stream to a simulator or a TLP224 card reader

---

# CadDevice

```
protected CadDevice(byte devProtocolType)
```

this form of constructor is used by PCSC streams are not applicable

**Parameters:**

devProtocolType - Protocol type (PCSC)

Method Detail

## getDeviceProtocol

```
public byte getDeviceProtocol()
```

Get the value of the protocol byte

**Returns:**

the value of the protocol byte

---

## getCadClientInstance

```
public static CadClientInterface getCadClientInstance(byte protocolType,  
                                                    java.io.InputStream in,  
                                                    java.io.OutputStream out)
```

A factory method

**Parameters:**

protocolType - Protocol constant

in - Input stream from a simulator

out - Output stream to a simulator

**Returns:**

New instance of a card connection

---

## getPCSCClientInstance

```
public static CadClientInterface getPCSCClientInstance(int readerNumber)
```

A factory method for connecting to a PCSC card readed



**Parameters:**

readerNumber - PC/SC reader number (0, 1, 2...)

**Returns:**

Connection to the reader

---

**close**

```
public void close()  
    throws java.io.IOException
```

Flush and close the input and output streams.

**Throws:**

java.io.IOException - If there is an error closing or flushing the input or output streams.

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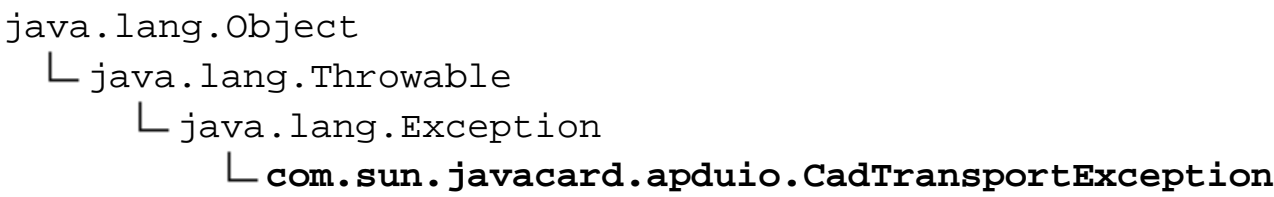
SUMMARY: NESTED | [FIELD](#) | [CONSTR](#) | [METHOD](#)

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com.sun.javacard.apduio

# Class CadTransportException



All Implemented Interfaces:

Known Subclasses:

[T1Exception](#), [TLP224Exception](#)

```
public abstract class CadTransportException

extends java.lang.Exception
```

This abstract class is the parent class of all CAD exception classes. It serves as an ancestor for T1Exception (for T=1 CAD) as well as TLP225Exception (for T=0 CAD) classes.

See Also:

Field Summary	
protected static java.util.ResourceBundle	<a href="#">_messages</a> Properties file with messages

protected int	<a href="#"><b>status</b></a> Error code
static int	<a href="#"><b>STATUS_UNKNOWN</b></a> Error code constant

Constructor Summary

[\*\*CadTransportException\*\*](#)(int status)  
Constructor method for exception class.

Method Summary

java. lang. String	<a href="#"><b>getMessage</b></a> ( ) Returns a String describing this exception.
int	<a href="#"><b>getStatus</b></a> ( ) Returns the status associated with the exception.

Methods inherited from class java.lang.Throwable

fillInStackTrace, getCause, getLocalizedMessage, getStackTrace, initCause, printStackTrace, printStackTrace, printStackTrace, setStackTrace, toString

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, wait, wait, wait

Field Detail

**`_messages`**

`protected static java.util.ResourceBundle _messages`

Properties file with messages

---

## status

```
protected int status
```

Error code

---

## STATUS\_UNKNOWN

```
public static int STATUS_UNKNOWN
```

Error code constant

## Constructor Detail

### CadTransportException

```
public CadTransportException(int status)
```

Constructor method for exception class.

#### Parameters:

`status` - Initialization status for this exception.

## Method Detail

### getStatus

```
public int getStatus()
```

Returns the status associated with the exception.

#### Returns:

The error status

---

# getMessage

```
public java.lang.String getMessage()
```

Returns a String describing this exception.

## Overrides:

getMessage in class `java.lang.Throwable`

## Returns:

the String describing this exception

---

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---

com.sun.javacard.apduio

# Class T1Exception

```
java.lang.Object
├ java.lang.Throwable
│   └ java.lang.Exception
│       └ com.sun.javacard.apduio.CadTransportException
│           └ com.sun.javacard.apduio.T1Exception
```

All Implemented Interfaces:

```
public class T1Exception
extends CadTransportException
```

This class represents error states for T=1 CAD devices.

See Also:

Field Summary	
static int	<a href="#">T1_BAD_CHECKSUM</a>
static int	<a href="#">T1_BLOCK_IO_ERROR</a>
static int	<a href="#">T1_FUNCTION_NOT_SUPPORTED</a>

static int	<a href="#">T1_PROTOCOL_VIOLATION</a>
static int	<a href="#">T1_UNINITIALIZED</a>
static int	<a href="#">T1_WRONG_LENGTH</a>

<b>Fields inherited from class com.sun.javacard.apduio.<a href="#">CadTransportException</a></b>
<a href="#">_messages</a> , <a href="#">status</a> , <a href="#">STATUS_UNKNOWN</a>

<b>Constructor Summary</b>
<div> <div><a href="#">T1Exception</a></div> <div>(int status)</div> <div>Constructor method for this exception class.</div> </div>

<b>Method Summary</b>
<div> <div> <div>java. lang. String</div> <div><a href="#">toString</a>( )</div> <div>Returns a String describing this exception.</div> </div> </div>

<b>Methods inherited from class com.sun.javacard.apduio.<a href="#">CadTransportException</a></b>
<a href="#">getMessage</a> , <a href="#">getStatus</a>

<b>Methods inherited from class java.lang.Throwable</b>
fillInStackTrace, getCause, getLocalizedMessage, getStackTrace, initCause, printStackTrace, printStackTrace, printStackTrace, setStackTrace

<b>Methods inherited from class java.lang.Object</b>
clone, equals, finalize, getClass, hashCode, notify, notifyAll, wait, wait, wait

## Field Detail

### T1\_WRONG\_LENGTH

```
public static final int T1_WRONG_LENGTH
```

See Also:

[Constant Field Values](#)

---

### T1\_UNINITIALIZED

```
public static final int T1_UNINITIALIZED
```

See Also:

[Constant Field Values](#)

---

### T1\_BLOCK\_IO\_ERROR

```
public static final int T1_BLOCK_IO_ERROR
```

See Also:

[Constant Field Values](#)

---

### T1\_FUNCTION\_NOT\_SUPPORTED

```
public static final int T1_FUNCTION_NOT_SUPPORTED
```

See Also:

[Constant Field Values](#)

---

### T1\_PROTOCOL\_VIOLATION



```
public static final int T1_PROTOCOL_VIOLATION
```

**See Also:**

[Constant Field Values](#)

---

## **T1\_BAD\_CHECKSUM**

```
public static final int T1_BAD_CHECKSUM
```

**See Also:**

[Constant Field Values](#)

## **Constructor Detail**

### **T1Exception**

```
public T1Exception(int status)
```

Constructor method for this exception class.

**Parameters:**

status - Initialization status for this exception.

## **Method Detail**

### **toString**

```
public java.lang.String toString()
```

Returns a String describing this exception.

**Overrides:**

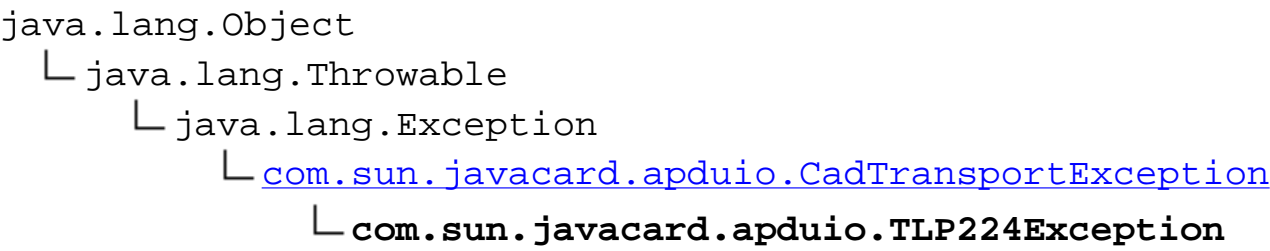
toString in class java.lang.Throwable

---



com.sun.javacard.apduio

# Class TLP224Exception



## All Implemented Interfaces:

public class **TLP224Exception**

extends [CadTransportException](#)

Exceptions related to TLP224 protocol violations

## See Also:

## Field Summary

Fields inherited from class com.sun.javacard.apduio. <a href="#">CadTransportException</a>
<a href="#">_messages</a> , <a href="#">_status</a> , <a href="#">STATUS_UNKNOWN</a>

## Constructor Summary

[\*\*TLP224Exception\*\*](#)(int status)

Constructor

## Method Summary

java.  
lang.  
String

[\*\*toString\*\*](#)()

Returns a String describing this exception.

Methods inherited from class `com.sun.javacard.apduio.CadTransportException`

[getMessage](#), [getStatus](#)

Methods inherited from class `java.lang.Throwable`

`fillInStackTrace`, `getCause`, `getLocalizedMessage`, `getStackTrace`,  
`initCause`, `printStackTrace`, `printStackTrace`, `printStackTrace`,  
`setStackTrace`

Methods inherited from class `java.lang.Object`

`clone`, `equals`, `finalize`, `getClass`, `hashCode`, `notify`, `notifyAll`,  
`wait`, `wait`, `wait`

## Constructor Detail

### TLP224Exception

```
public TLP224Exception(int status)
```

Constructor

**Parameters:**

status - status code

## Method Detail

### toString



## Package com.sun.javacard.apduio

Provides a client API for exchanging APDUs with smart cards.

See:

[Description](#)

### Interface Summary

<a href="#">CadClientInterface</a>	An interface describing a client connection to a card.
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### Class Summary

<a href="#">Apdu</a>	This class represent a pair of C-APDU and R-APDU.
<a href="#">CadDevice</a>	Factory class producing CardClientInterface instances (connections to a card)

### Exception Summary

<a href="#">CadTransportException</a>	This abstract class is the parent class of all CAD exception classes.
<a href="#">T1Exception</a>	This class represents error states for T=1 CAD devices.
<a href="#">TLP224Exception</a>	Exceptions related to TLP224 protocol violations

## Package com.sun.javacard.apduio Description

Provides a client API for exchanging APDUs with smart cards.

It is used internally by several components of the Java Card development kit.

**Package** [Class](#) **Tree** **Deprecated** **Index** **Help**

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---

## Hierarchy For Package com.sun.javacard.apduio

### Class Hierarchy

- java.lang.Object
  - com.sun.javacard.apduio.[Apu](#)
  - com.sun.javacard.apduio.[CadDevice](#)
  - java.lang.Throwable
    - java.lang.Exception
      - com.sun.javacard.apduio.[CadTransportException](#)
        - com.sun.javacard.apduio.[T1Exception](#)
        - com.sun.javacard.apduio.[TLP224Exception](#)

### Interface Hierarchy

- com.sun.javacard.apduio.[CadClientInterface](#)



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# Deprecated API

---

## Contents

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## A

**[Apdu](#)** - Class in [com.sun.javacard.apduio](#)

This class represent a pair of C-APDU and R-APDU.

**[Apdu\(\)](#)** - Constructor for class com.sun.javacard.apduio.[Apdu](#)

Creates a new instance of Apdu.

**[APDU\\_TYPE\\_MASK](#)** - Static variable in class com.sun.javacard.apduio.[Apdu](#)

Mask to extract APDU type information: either ISO ecoding or not.

---

## C

**[CadClientInterface](#)** - Interface in [com.sun.javacard.apduio](#)

An interface describing a client connection to a card.

**[CadDevice](#)** - Class in [com.sun.javacard.apduio](#)

Factory class producing CardClientInterface instances (connections to a card)

**[CadDevice\(byte, InputStream, OutputStream\)](#)** - Constructor for class com.sun.javacard.apduio.

[CadDevice](#)

this form of constructor is used by T=0, T=1 implementations

**[CadDevice\(byte\)](#)** - Constructor for class com.sun.javacard.apduio.[CadDevice](#)

this form of constructor is used by PCSC streams are not applicable

**[CadTransportException](#)** - Exception in [com.sun.javacard.apduio](#)

This abstract class is the parent class of all CAD exception classes.

**[CadTransportException\(int\)](#)** - Constructor for exception com.sun.javacard.apduio.

[CadTransportException](#)

Constructor method for exception class.

**[CASE\\_1](#)** - Static variable in class com.sun.javacard.apduio.[Apdu](#)

The value which indicates this Apdu is an ISO 7816-3 Case 1 apdu

**[CASE\\_2E](#)** - Static variable in class com.sun.javacard.apduio.[Apdu](#)

The value which indicates this Apdu is an ISO 7816-3 Case 2 Extended apdu

**[CASE\\_2S](#)** - Static variable in class com.sun.javacard.apduio.[Apdu](#)

The value which indicates this Apdu is an ISO 7816-3 Case 2 Short apdu

**[CASE\\_3E](#)** - Static variable in class com.sun.javacard.apduio.[Apdu](#)

The value which indicates this Apdu is an ISO 7816-3 Case 3 Extended apdu

**CASE\_3S** - Static variable in class com.sun.javacard.apduio.[Apdu](#)

The value which indicates this Apdu is an ISO 7816-3 Case 3 Short apdu

**CASE\_4E** - Static variable in class com.sun.javacard.apduio.[Apdu](#)

The value which indicates this Apdu is an ISO 7816-3 Case 4 Extended apdu

**CASE\_4S** - Static variable in class com.sun.javacard.apduio.[Apdu](#)

The value which indicates this Apdu is an ISO 7816-3 Case 4 Short apdu

**CLA** - Static variable in class com.sun.javacard.apduio.[Apdu](#)

The offset in the command array to the ISO 7816-3 CLA octet.

**close()** - Method in class com.sun.javacard.apduio.[CadDevice](#)

Flush and close the input and output streams.

**com.sun.javacard.apduio** - package com.sun.javacard.apduio

Provides a client API for exchanging APDUs with smart cards.

**command** - Variable in class com.sun.javacard.apduio.[Apdu](#)

Internal representation of the C-APDU header

---

## D

**dataIn** - Variable in class com.sun.javacard.apduio.[Apdu](#)

Data part of the C-APDU

**dataOut** - Variable in class com.sun.javacard.apduio.[Apdu](#)

Data part of the R-APDU

**debug** - Variable in class com.sun.javacard.apduio.[CadDevice](#)

Internal debug flag.

**deviceProtocol** - Variable in class com.sun.javacard.apduio.[CadDevice](#)

The currently used protocol

---

## E

**exchangeApdu(Apdu)** - Method in interface com.sun.javacard.apduio.[CadClientInterface](#)

Exchanges com.sun.javacard.apduio.Apdu with a card.

---

## G

**[getCadClientInstance\(byte, InputStream, OutputStream\)](#)** - Static method in class com.sun.javacard.apduio.[CadDevice](#)

A factory method

**[getCase\(\)](#)** - Method in class com.sun.javacard.apduio.[Apu](#)

Return the ISO 7816-3 Case of this Apdu

**[getChannelInfo\(\)](#)** - Method in class com.sun.javacard.apduio.[Apu](#)

Determines the channel number

**[getCommand\(\)](#)** - Method in class com.sun.javacard.apduio.[Apu](#)

Get internal representation of the header of the C-APDU

**[getCommandApuBytes\(\)](#)** - Method in class com.sun.javacard.apduio.[Apu](#)

returns the command APDU as a byte array.

**[getDataIn\(\)](#)** - Method in class com.sun.javacard.apduio.[Apu](#)

Get the data part of the C-APDU

**[getDataOut\(\)](#)** - Method in class com.sun.javacard.apduio.[Apu](#)

Get the data part of the R-APDU

**[getDeviceProtocol\(\)](#)** - Method in class com.sun.javacard.apduio.[CadDevice](#)

Get the value of the protocol byte

**[getLc\(\)](#)** - Method in class com.sun.javacard.apduio.[Apu](#)

Get Lc

**[getLe\(\)](#)** - Method in class com.sun.javacard.apduio.[Apu](#)

Get Le

**[getMessage\(\)](#)** - Method in exception com.sun.javacard.apduio.[CadTransportException](#)

Returns a String describing this exception.

**[getPCSCClientInstance\(int\)](#)** - Static method in class com.sun.javacard.apduio.[CadDevice](#)

A factory method for connecting to a PCSC card readed

**[getResponseApuBytes\(\)](#)** - Method in class com.sun.javacard.apduio.[Apu](#)

returns the response APDU as a byte array.

**[getStatus\(\)](#)** - Method in class com.sun.javacard.apduio.[Apu](#)

Get status (SW bytes) as integer

**[getStatus\(\)](#)** - Method in exception com.sun.javacard.apduio.[CadTransportException](#)

Returns the status associated with the exception.

**[getSw1Sw2\(\)](#)** - Method in class com.sun.javacard.apduio.[Apu](#)

Get status bytes

---

**[in](#)** - Variable in class com.sun.javacard.apduio.[CadDevice](#)

The input stream which data is read from.

**INS** - Static variable in class com.sun.javacard.apduio.[Apdu](#)

The offset in the command array to the ISO 7816-3 INS octet.

**isExtended** - Variable in class com.sun.javacard.apduio.[Apdu](#)

Extended APDU flag

---

## L

**Lc** - Variable in class com.sun.javacard.apduio.[Apdu](#)

Value of Lc

**Le** - Variable in class com.sun.javacard.apduio.[Apdu](#)

Value of Le

**LOGICAL\_CHN\_MASK** - Static variable in class com.sun.javacard.apduio.[Apdu](#)

Mask to extract channel information out of the CLA byte.

---

## O

**out** - Variable in class com.sun.javacard.apduio.[CadDevice](#)

The output stream to which data is written.

---

## P

**P1** - Static variable in class com.sun.javacard.apduio.[Apdu](#)

The offset in the command array to the ISO 7816-3 P1 octet.

**P2** - Static variable in class com.sun.javacard.apduio.[Apdu](#)

The offset in the command array to the ISO 7816-3 P2 octet.

**P3** - Static variable in class com.sun.javacard.apduio.[Apdu](#)

The offset in the command array to the ISO 7816-3 P3 octet.

**powerDown(boolean)** - Method in interface com.sun.javacard.apduio.[CadClientInterface](#)

Send powerdown to a card

**powerDown()** - Method in interface com.sun.javacard.apduio.[CadClientInterface](#)

Powerdown a card or simulator and then disconnect

**powerUp()** - Method in interface com.sun.javacard.apduio.[CadClientInterface](#)

Send powerup to a card or a simulator

**PROTOCOL\_PCSC** - Static variable in class com.sun.javacard.apduio.[CadDevice](#)

PC/SC constant

**PROTOCOL\_T0** - Static variable in class com.sun.javacard.apduio.[CadDevice](#)

Protocol constant

**PROTOCOL\_T1** - Static variable in class com.sun.javacard.apduio.[CadDevice](#)

Protocol constant

**PROTOCOL\_TCL** - Static variable in class com.sun.javacard.apduio.[CadDevice](#)

Protocol constant

---

## S

**setDataIn(byte[])** - Method in class com.sun.javacard.apduio.[Apu](#)

Set the data of the C-APDU

**setDataIn(byte[], int)** - Method in class com.sun.javacard.apduio.[Apu](#)

Set the data of the C-APDU

**setDataOut(byte[])** - Method in class com.sun.javacard.apduio.[Apu](#)

Set the data part of the R-APDU

**setDataOut(byte[], int)** - Method in class com.sun.javacard.apduio.[Apu](#)

Set the data part of the R-APDU

**setLc(int)** - Method in class com.sun.javacard.apduio.[Apu](#)

Set the value of Lc

**setLe(int)** - Method in class com.sun.javacard.apduio.[Apu](#)

Set Le

**status** - Variable in exception com.sun.javacard.apduio.[CadTransportException](#)

Error code

**STATUS\_UNKNOWN** - Static variable in exception com.sun.javacard.apduio.[CadTransportException](#)

Error code constant

**sw1sw2** - Variable in class com.sun.javacard.apduio.[Apu](#)

Status as byte array

---

## T

**T1\_BAD\_CHECKSUM** - Static variable in exception com.sun.javacard.apduio.[T1Exception](#)

**T1\_BLOCK\_IO\_ERROR** - Static variable in exception com.sun.javacard.apduio.[T1Exception](#)

[\*\*T1\\_FUNCTION\\_NOT\\_SUPPORTED\*\*](#) - Static variable in exception com.sun.javacard.apduio.[T1Exception](#)

[\*\*T1\\_PROTOCOL\\_VIOLATION\*\*](#) - Static variable in exception com.sun.javacard.apduio.[T1Exception](#)

[\*\*T1\\_UNINITIALIZED\*\*](#) - Static variable in exception com.sun.javacard.apduio.[T1Exception](#)

[\*\*T1\\_WRONG\\_LENGTH\*\*](#) - Static variable in exception com.sun.javacard.apduio.[T1Exception](#)

[\*\*T1Exception\*\*](#) - Exception in [com.sun.javacard.apduio](#)

This class represents error states for T=1 CAD devices.

[\*\*T1Exception\(int\)\*\*](#) - Constructor for exception com.sun.javacard.apduio.[T1Exception](#)

Constructor method for this exception class.

[\*\*TLP224Exception\*\*](#) - Exception in [com.sun.javacard.apduio](#)

Exceptions related to TLP224 protocol violations

[\*\*TLP224Exception\(int\)\*\*](#) - Constructor for exception com.sun.javacard.apduio.[TLP224Exception](#)

Constructor

[\*\*toString\(\)\*\*](#) - Method in class com.sun.javacard.apduio.[Apu](#)

Generate a string representation of this Apdu in the ApduTool output format.

[\*\*toString\(\)\*\*](#) - Method in exception com.sun.javacard.apduio.[T1Exception](#)

Returns a String describing this exception.

[\*\*toString\(\)\*\*](#) - Method in exception com.sun.javacard.apduio.[TLP224Exception](#)

Returns a String describing this exception.

---

[\*\*\\_messages\*\*](#) - Static variable in class com.sun.javacard.apduio.[CadDevice](#)

Properties file with messages

[\*\*\\_messages\*\*](#) - Static variable in exception com.sun.javacard.apduio.[CadTransportException](#)

Properties file with messages

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## How This API Document Is Organized

This API (Application Programming Interface) document has pages corresponding to the items in the navigation bar, described as follows.

### Package

Each package has a page that contains a list of its classes and interfaces, with a summary for each. This page can contain four categories:

- Interfaces (*italic*)
- Classes
- Enums
- Exceptions
- Errors
- Annotation Types

### Class/Interface

Each class, interface, nested class and nested interface has its own separate page. Each of these pages has three sections consisting of a class/interface description, summary tables, and detailed member descriptions:

- Class inheritance diagram
- Direct Subclasses
- All Known Subinterfaces
- All Known Implementing Classes
- Class/interface declaration
- Class/interface description
- Nested Class Summary
- Field Summary
- Constructor Summary
- Method Summary
- Field Detail



- Constructor Detail
- Method Detail

Each summary entry contains the first sentence from the detailed description for that item. The summary entries are alphabetical, while the detailed descriptions are in the order they appear in the source code. This preserves the logical groupings established by the programmer.

## Annotation Type

Each annotation type has its own separate page with the following sections:

- Annotation Type declaration
- Annotation Type description
- Required Element Summary
- Optional Element Summary
- Element Detail

## Enum

Each enum has its own separate page with the following sections:

- Enum declaration
- Enum description
- Enum Constant Summary
- Enum Constant Detail

## Tree (Class Hierarchy)

There is a [Class Hierarchy](#) page for all packages, plus a hierarchy for each package. Each hierarchy page contains a list of classes and a list of interfaces. The classes are organized by inheritance structure starting with `java.lang.Object`. The interfaces do not inherit from `java.lang.Object`.

- When viewing the Overview page, clicking on "Tree" displays the hierarchy for all packages.
- When viewing a particular package, class or interface page, clicking "Tree" displays the hierarchy for only that package.

## Deprecated API

The [Deprecated API](#) page lists all of the API that have been deprecated. A deprecated API is not recommended for use, generally due to improvements, and a replacement API is usually given. Deprecated APIs may be removed in future implementations.

## Index

The [Index](#) contains an alphabetic list of all classes, interfaces, constructors, methods, and fields.

## Prev/Next

These links take you to the next or previous class, interface, package, or related page.

## Frames/No Frames

These links show and hide the HTML frames. All pages are available with or without frames.

## Constant Field Values

The [Constant Field Values](#) page lists the static final fields and their values.

*This help file applies to API documentation generated using the standard doclet.*

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## All Classes

[Apdu](#)

[\*CadClientInterface\*](#)

[CadDevice](#)

[CadTransportException](#)

[T1Exception](#)

[TLP224Exception](#)

## Constant Field Values

### Contents

- [com.sun.\\*](#)

### com.sun.\*

#### com.sun.javacard.apduio.[Apdu](#)

public static final int	<a href="#">APDU_TYPE_MASK</a>	240
public static final int	<a href="#">CASE_1</a>	1
public static final int	<a href="#">CASE_2E</a>	5
public static final int	<a href="#">CASE_2S</a>	2
public static final int	<a href="#">CASE_3E</a>	6
public static final int	<a href="#">CASE_3S</a>	3
public static final int	<a href="#">CASE_4E</a>	7
public static final int	<a href="#">CASE_4S</a>	4
public static final int	<a href="#">CLA</a>	0
public static final int	<a href="#">INS</a>	1
public static final int	<a href="#">LOGICAL_CHN_MASK</a>	3
public static final int	<a href="#">P1</a>	2
public static final int	<a href="#">P2</a>	3
public static final int	<a href="#">P3</a>	4

#### com.sun.javacard.apduio.[CadDevice](#)

public static final byte	<a href="#">PROTOCOL_PCSC</a>	-85
public static final byte	<a href="#">PROTOCOL_T0</a>	0
public static final byte	<a href="#">PROTOCOL_T1</a>	1
public static final byte	<a href="#">PROTOCOL_TCL</a>	91

<b>com.sun.javacard.apduio.<a href="#">T1Exception</a></b>		
public static final int	<a href="#">T1_BAD_CHECKSUM</a>	-123
public static final int	<a href="#">T1_BLOCK_IO_ERROR</a>	-126
public static final int	<a href="#">T1_FUNCTION_NOT_SUPPORTED</a>	-125
public static final int	<a href="#">T1_PROTOCOL_VIOLATION</a>	-124
public static final int	<a href="#">T1_UNINITIALIZED</a>	-127
public static final int	<a href="#">T1_WRONG_LENGTH</a>	-128

## Hierarchy For All Packages

### Package Hierarchies:

[com.sun.javacard.apduio](#)

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## Class Hierarchy

- java.lang.Object
  - com.sun.javacard.apduio.[Apu](#)
  - com.sun.javacard.apduio.[CadDevice](#)
  - java.lang.Throwable
    - java.lang.Exception
      - com.sun.javacard.apduio.[CadTransportException](#)
        - com.sun.javacard.apduio.[T1Exception](#)
        - com.sun.javacard.apduio.[TLP224Exception](#)

## Interface Hierarchy

- com.sun.javacard.apduio.[CadClientInterface](#)

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