# **Secure Element Applet API**

Communication with a Secure element Applet API is performed through standard APDU commands.

For a detailed description of APDU communication, APDU commands data structure and particular bytes meaning, please refer to ISO/IEC 7816-4 standard.

Commands are grouped into three categories based on the type of usage:

- 1. General
- 2. Fiscalization
- 3. Audit

# **Important Notes**

- 1. All APDU commands are sent to the Smart Card using T1 communication protocol
- 2. All amounts or counter values are submitted to/received from the Secure element using Big-endian. Big-endian is an order in which the "big end" (most significant value in the sequence) is stored first (at the lowest storage address)
- 3. P1 and P2 values considered in the request processing when,
  - 1. Select Applet Command
  - 2. force using CRC for Data in APDU transimission
- 4. PIN is sent in ASCII hex format from SE applet version 3.2.2.
- 5. CRC is available from SE applet version 3.2.5, and it is optional to use.

# **Content**

1.

### **General Commands**

Secure Element Applet is installed as a non-default applet on a smart card. Before any APDU command is invoked, the applet is selected using the standard Select command.

2.

#### **Fiscalization**

PIN verification is a method that "unlocks" a card for invoice signing and other operations protected by PIN code. Depending on the SE applet version, PIN is sent in decimal or hex format with ASCII encoding, and it is sent as an array of byte digits.

3.

### <u>Audit</u>

Returns 259 bytes data structure represents public card key (256 bytes modulus and 3 bytes exponent). This key is used to encrypt Audit packages.

4.

#### Secure Element Specific APDU Error Codes

This table contains the expected error codes and descriptions that a caller may encounter while working

# **General Commands**

Secure Element Applet is installed as a non-default applet on a smart card. Before any APDU command is invoked, the applet is selected using the standard Select command.

#### **NOTE:**

The availability of specific commands, as well as their content, depends on the secure element (SE) version. You can use the *Get Secure Element Version* command (see below) to check the version of the SE you are using.

# **Select Applet**

As previously mentioned, the Smart Card has two applets installed. This command selects the Secure Element Applet and routes subsequent APDU commands to it.

## **APDU Request**

| SE<br>Version | IsoCase  | Class | Instruction | P1-P2  | Command<br>Length<br>(Lc) | Command<br>Data | Expecte<br>Lengtl<br>(Le) |
|---------------|----------|-------|-------------|--------|---------------------------|-----------------|---------------------------|
| >= 2.0.0      | Case3Sho | 0x00  | 0xA4        | 0x040( | 0x10                      | 0xA000000748    | 0x00                      |

## **APDU Response**

| SE Version | Response Data | SW1SW2 |
|------------|---------------|--------|
| >= 2.0.0   | none          | 0x9000 |

#### **Example:**

Request: 00A4040010A000000748464A492D546178436F726500

Response: 9000

# **Get Secure Element Version**

This command returns the version information about the current Api version. The response contains 12 bytes, where each 4 bytes represent unsigned integer of one version segment, making total of 3 version segments: major, minor and patch.

## **APDU Request**

| SE CAP<br>Version | IsoCase  | Class | Instruction | P1-P2  | Command<br>Length<br>(Lc) | Command<br>Data | Expected<br>Length<br>(Le) |
|-------------------|----------|-------|-------------|--------|---------------------------|-----------------|----------------------------|
| >= 2.0.0          | Case2Sho | 0x88  | 0x08        | 0x000C | none                      | none            | 0x00                       |

## **APDU Response**

| SE CAP Version | Response Data | SW1SW2 |
|----------------|---------------|--------|
| >= 2.0.0       | 12 bytes      | 0x9000 |

### **Example 1:**

Request: 8808040000

#### **Example 2:**

Request: 8808000000

Response: 00000003000000100000001 9000

#### **Example 3:**

Request: 8808000000

Response: 00000003000000200000005 9000

# **Forward Secure Element Directive**

This command is used by E-SDC to forward instructions received from TaxCore.Api to Secure Element Applet via Secure Element APDU Command.

If APDU Command status (SW1SW2) is OK ( $0 \times 9000$ ), consider forward instructions operation is completed.

#### **NOTE:**

From the SE version 3.2.5, optionally, CRC can be calculated and used for data verification. If CRC is not used, the command is the same as in the previous applet version.

# **APDU Request**

| SE<br>Version          | IsoCase  | Class | Instruction | P1-P2  | Command<br>Length<br>(Lc) | Command<br>Data  | Expected<br>Length<br>(Le) |
|------------------------|----------|-------|-------------|--------|---------------------------|--|----------------------------|
| >= 2.0.0<br>(no CRC)   | Case3Ext | 0x88  | 0x40        | 0×040( | 0x000200                  | 512 bytes<br>received<br>from<br>TaxCore                         | none                       |
| >= 3.2.5<br>(with CRC) | Case3Ext | 0x88  | 0x40        | 0x0102 | 0x000204                  | 512 bytes<br>received<br>from<br>TaxCore<br>+ 4 bytes<br>for CRC | none                       |

# **APDU Response**

| SE Version          | Response Data | SW1SW2 |
|---------------------|---------------|--------|
| >= 2.0.0 (no CRC)   | none          | 0x9000 |
| >= 3.2.5 (with CRC) | none          | 0x9000 |

### **Example 1 (without CRC):**

#### Command Data:

5DBFC9CD04AF9DC76C50FA3FF54D32D1910B0D2E1EC5AF97EAE3E71A7423CCE066D6E264255838C1DBAD

#### Request:

884004000002005DBFC9CD04AF9DC76C50FA3FF54D32D1910B0D2E1EC5AF97EAE3E71A7423CCE066D6E2

Response: 9000

### **Example 2 (with CRC):**

### Command Data witout CRC:

5DBFC9CD04AF9DC76C50FA3FF54D32D1910B0D2E1EC5AF97EAE3E71A7423CCE066D6E264255838C1DBAD

Command Data CRC: F50CFF4B

#### Command Data:

5DBFC9CD04AF9DC76C50FA3FF54D32D1910B0D2E1EC5AF97EAE3E71A7423CCE066D6E264255838C1DBAD

#### Request:

88400400002045DBFC9CD04AF9DC76C50FA3FF54D32D1910B0D2E1EC5AF97EAE3E71A7423CCE066D6E2

Response: 9000

# **Export Certificate**

This command exports the taxpayer certificate in a DER format. This certificate contains location data that is present on the textual representation of an invoice.

## **APDU Request**

| SE<br>Version | IsoCase  | Class | Instruction | P1-P2  | Command<br>Length<br>(Lc) | Command<br>Data | Expected<br>Length<br>(Le) |
|---------------|----------|-------|-------------|--------|---------------------------|-----------------|----------------------------|
| >= 2.0.0      | Case2Ext | 0x88  | 0×04        | 0x0400 | none                      | none            | 0x000000                   |

## **APDU Response**

| SE Version | Response Data           | SW1SW2 |
|------------|-------------------------|--------|
| >= 2.0.0   | raw bytes random length | 0x9000 |

#### **Example:**

Request: 8804040000000

Response: raw bytes of x509 certificate public key + 9000

# **Get Last Signed Invoice**

This command returns information about the last singed invoice. The structure of the data recived is the same as the response is in the Sign Invoice command.

#### NOTE:

From the SE version 3.2.5, optionally, CRC can be calculated and used for data verification. If CRC is not used, the command is the same as in the previous applet version.

## **APDU Request**

| SE<br>Version          | IsoCase  | Class | Instruction | P1-P2  | Command<br>Length<br>(Lc) | Command<br>Data | Expected<br>Length<br>(Le) |
|------------------------|----------|-------|-------------|--------|---------------------------|-----------------|----------------------------|
| >= 3.1.1<br>(no CRC)   | Case2Ext | 0x88  | 0x15        | 0x040( | none                      | none            | 0x000000                   |
| >= 3.2.5<br>(with CRC) | Case2Ext | 0x88  | 0x15        | 0x0102 | none                      | none            | 0x000000                   |

# **APDU** Response

| SE Version          | Response Data    | SW1SW2 |
|---------------------|------------------|--------|
| >= 3.1.1 (no CRC)   | 577 or 833 bytes | 0x9000 |
| >= 3.2.5 (with CRC) | 581 or 837 bytes | 0x9000 |

## Example 1 (without CRC):

Request: 8815040000000

Response: *577 or 833 bytes* + 9000

## **Response Data**

| Start (byte) | Length (bytes) | Field                        | Description                         |
|--------------|----------------|------------------------------|-------------------------------------|
| 0            | 8              | Date/time                    | Same as data sent from E-SDC to SE  |
| 8            | 20             | Taxpayer ID                  | Same as data sent from E-SDC to SE  |
| 28           | 20             | Buyer ID                     | Same as data sent from E-SDC to SE  |
| 48           | 1              | Invoice type                 | Same as data sent from E-SDC to SE  |
| 49           | 1              | Transaction type             | Same as data sent from E-SDC to SE  |
| 50           | 7              | Invoice amount               | Same as data sent from E-SDC to SE  |
| 57           | 4              | Sale or refund counter value | Depends on request's Tax type field |
|              |                |                              |                                     |

| 61         | 4          | Total counter value (sale+refund) | Unsigned int 32bit big endian,  |
|------------|------------|-----------------------------------|---|
| 65         | 256 or 512 | Encrypted Internal Data           | Encrypted Internal Data length<br>depends on the number of<br>available tax rates programmed<br>during personalization. It may be<br>256 or 512 bytes long. |
| 321 or 577 | 256        | Digital signature                 |   |

## Example 2 (with CRC):

Request: 8815010200

Response: *581 or 837* + 9000

### **Response Data**

| Start (byte) | Length (bytes) | Field                             | Description   |
|--------------|----------------|-----------------------------------|---|
| 0            | 8              | Date/time                         | Same as data sent from E-SDC to SE  |
| 8            | 20             | Taxpayer ID                       | Same as data sent from E-SDC to SE  |
| 28           | 20             | Buyer ID                          | Same as data sent from E-SDC to SE  |
| 48           | 1              | Invoice type                      | Same as data sent from E-SDC to SE  |
| 49           | 1              | Transaction type                  | Same as data sent from E-SDC to SE  |
| 50           | 7              | Invoice amount                    | Same as data sent from E-SDC to SE  |
| 57           | 4              | Sale or refund counter value      | Depends on request's Tax type field   |
| 61           | 4              | Total counter value (sale+refund) | Unsigned int 32bit big endian,  |
| 65           | 256 or 512     | Encrypted Internal Data           | Encrypted Internal Data length<br>depends on the number of<br>available tax rates programmed<br>during personalization. It may be<br>256 or 512 bytes long. |
| 321 or 577   | 256            | Digital signature                 |   |
| 577 or 833   | 4              | CRC                               | CRC is calculated from 0 to 577 or 833 bytes.   |

# **Get PIN tries left from SE Applet**

This command returns how many PIN tries are left before the card is locked

## **APDU Request**

| SE<br>Version | IsoCase  | Class | Instruction | P1-P2  | Command<br>Length<br>(Lc) | Command<br>Data | Expected<br>Length<br>(Le) |
|---------------|----------|-------|-------------|--------|---------------------------|-----------------|----------------------------|
| >= 3.1.1      | Case2Sho | 0x00  | 0x16        | 0x0400 | none                      | none            | 0x00                       |

## **APDU** Response

| SE Version | Response Data                                     | SW1SW2 |
|------------|---|--------|
| >= 3.1.1   | 05 if 5 tries are left, 00 if the card is blocked | 0x9000 |

### **Example:**

Request: 8816040000

**Response:** 05 9000

# **Fiscalization**

# **PIN Verify**

PIN verification is a method that "unlocks" a card for invoice signing and other operations protected by PIN code. Depending on the SE applet version, PIN is sent in decimal or hex format with ASCII encoding, and it is sent as an array of byte digits.

For example, PIN 1234 can be represented in the following formats:

decimal format - PIN is represented as 0x01, 0x02, 0x03, 0x04.

ASCII hex format - PIN is represented as 0x31, 0x32, 0x33, 0x34.

# **APDU Request**

| SE<br>Version                    | IsoCase  | Class | Instruction | P1-P2  | Command<br>Length<br>(Lc) | Command<br>Data   | Expected<br>Length<br>(Le) |
|----------------------------------|----------|-------|-------------|--------|---------------------------|---|----------------------------|
| 2.0.0 □ SE<br>version <<br>3.2.2 | Case3Sho | 0x88  | 0x11        | 0x000( | 0×04                      | 4 bytes where each represents one PIN digit in decimal format   | none                       |
| >= 3.2.2                         | Case3Sho | 0x88  | 0x11        | 0x0000 | 0x04                      | 4 bytes where each represents one PIN digit in ASCII hex format | none                       |

### **Example:**

This is an example for PIN 1234.

| SE Version                 | Command Data | Request           | Response<br>(correct PIN) | Error response<br>(wrong PIN) |
|----------------------------|--------------|-------------------|---------------------------|-------------------------------|
| 2.0.0 □ SE version < 3.2.2 | 01020304     | 88110000040102030 | 9000                      | 6302                          |
| >= 3.2.2                   | 31323334     | 88110000043132333 | 9000                      | 6302                          |

# **Sign Invoice**

Signs invoice and returns fiscalization data for a submitted invoice.

### **NOTE:**

From the SE version 3.2.5, optionally, CRC can be calculated and used for data verification. If CRC is not used, the command is the same as in the previous applet version.

# **APDU Request**

| SE<br>Version          | IsoCase  | Class | Instruction | P1-P2  | Command<br>Length<br>(Lc)                         | Command<br>Data                           | Expected<br>Length<br>(Le) |
|------------------------|----------|-------|-------------|--------|---|---|----------------------------|
| >= 2.0.0<br>(no CRC)   | Case4Ext | 0x88  | 0x13        | 0x0400 | 3 byte<br>Command<br>Data byte<br>array<br>length | Command<br>Data byte<br>array             | 0x0000                     |
| >= 3.2.5<br>(with CRC) | Case4Ext | 0x88  | 0x13        | 0x0102 | 3 byte<br>Command<br>Data byte<br>array<br>length | Command Data byte array + 4 bytes for CRC | 0x0000                     |

# **APDU Response**

| SE Version          | Response Data           | SW1SW2 |
|---------------------|-------------------------|--------|
| >= 2.0.0 (no CRC)   | byte array              | 0x9000 |
| >= 3.2.5 (with CRC) | byte array + 4 byte CRC | 0x9000 |

### **Data structure without CRC:**

### Command data:

| Start<br>(byte) | Length<br>(byte) | Field       | Description  |
|-----------------|------------------|-------------|--|
| 0               | 8                | Date/time   | E-SDC timestamp UTC time in Unix Timestamp. Example: 1495018011910 is 2017-05-17T10:46:51.910Z   |
| 8               | 20               | Taxpayer ID | Hex encoded byte array, leading bytes filled with 0x00. Taxpayer ID value can consist only of ascii printable characters. <b>Zeros can be added only on the left side</b> . MSB are sent first Example: Taxpayer ID = 928615467, Byte array = {0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x39, 0x32, 0x38, 0x36, 0x31, 0x35, 0x34, 0x36, 0x37} |

|    |    |                          | (byte 0x37 is sent last to SE)  |
|----|----|--------------------------|---|
| 28 | 20 | Buyer ID                 | If unknown, leave zeroes. Formatting is the same as for Taxpayer ID   |
| 48 | 1  | Invoice type             | Values 0, 1, 2, 3, 4 as explained in section <u>Create Invoice</u> .  |
| 49 | 1  | Transaction Type         | Sale=0, Refund=1  |
| 50 | 7  | Invoice amount           | Sale or refund total amount (including taxes) - depends on applied tax types  |
| 57 | 1  | Number of tax categories | Defines the number of tax categories which appear on<br>the invoice (value between 0 and 26). The following data<br>structure <b>Tax Categories</b> must be repeated exactly this<br>number of times. |
| 58 | 8  | Tax Category (1)         | The first Tax Category (mandatory if <b>Number of tax</b> categories > <b>0</b> )   |
| 66 | 8  | Tax Category (2)         | The second Tax Category (mandatory if <b>Number of tax</b> categories > 1)  |
| 74 |    | Tax Category (n)         |   |

## Tax Categories:

| Start<br>(byte) | Length<br>(byte) | Field                 | Description  |
|-----------------|------------------|-----------------------|--|
| 58              | [1]              | [Tax category ID]     | The first tax category's OrderID, as explained in <u>Tax Rates</u> section (mandatory if <b>Number of tax categories</b> > 0)                      |
| 59              | [7]              | [Tax category amount] | The first total tax amount for the category specified in preceding field <b>Tax category ID</b> (mandatory if <b>Number of tax categories</b> > 0) |
| 66              | [1]              | [Tax category ID]     | The next tax category's OrderID (mandatory if <b>Number of tax categories</b> > 1)   |
| 67              | [7]              | [Tax category amount] | The next total tax amount for the category specified in preceding field <b>Tax category ID</b> (mandatory if <b>Number of tax categories</b> > 1)  |

### Response data:

| Start (byte) | Length (bytes) | Field                             | Description   |
|--------------|----------------|-----------------------------------|---|
| 0            | 8              | Date/time                         | Same as data sent from E-SDC to SE  |
| 8            | 20             | Taxpayer ID                       | Same as data sent from E-SDC to SE  |
| 28           | 20             | Buyer ID                          | Same as data sent from E-SDC to SE  |
| 48           | 1              | Invoice type                      | Same as data sent from E-SDC to SE  |
| 49           | 1              | Transaction type                  | Same as data sent from E-SDC to SE  |
| 50           | 7              | Invoice amount                    | Same as data sent from E-SDC to SE  |
| 57           | 4              | Sale or refund counter value      | Depends on request's Tax type field   |
| 61           | 4              | Total counter value (sale+refund) | unsigned int 32bit big endian,  |
| 65           | 256 or 512     | Encrypted Internal Data           | Encrypted Internal Data length<br>depends on the number of<br>available tax rates programmed<br>during personalization. It may be<br>256 or 512 bytes long. |
| 321 or 577   | 256            | Digital signature                 |   |

### **Example without CRC:**

#### Command Data:

### Request:

Response: *byte array* + 9000

#### **Data structure with CRC:**

### Command data:

| Start<br>(byte) | Length<br>(byte) | Field     | Description  |
|-----------------|------------------|-----------|--|
| 0               | 8                | Date/time | E-SDC timestamp UTC time in Unix Timestamp. Example: 1495018011910 is 2017-05-17T10:46:51.910Z |

| 8  | 20 | Taxpayer ID              | Hex encoded byte array, leading bytes filled with 0x00. Taxpayer ID value can consist only of ascii printable characters. <b>Zeros can be added only on the left side</b> . MSB are sent first Example: Taxpayer ID = 928615467, Byte array = {0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x39, 0x32, 0x38, 0x36, 0x31, 0x35, 0x34, 0x36, 0x37} (byte 0x37 is sent last to SE) |
|----|----|--------------------------|---|
| 28 | 20 | Buyer ID                 | If unknown, leave zeroes. Formatting is the same as for Taxpayer ID   |
| 48 | 1  | Invoice type             | Values 0, 1, 2, 3, 4 as explained in section <u>Create Invoice</u> .  |
| 49 | 1  | Transaction Type         | Sale=0, Refund=1  |
| 50 | 7  | Invoice amount           | Sale or refund total amount (including taxes) - depends on applied tax types  |
| 57 | 1  | Number of tax categories | Defines the number of tax categories which appear on<br>the invoice (value between 0 and 26). The following data<br>structure <b>Tax Categories</b> must be repeated exactly this<br>number of times.   |
| 58 | 8  | Tax Category (1)         | The first Tax Category (mandatory if <b>Number of tax</b> categories > <b>0</b> )   |
| 66 | 8  | Tax Category (2)         | The second Tax Category (mandatory if <b>Number of tax</b> categories > 1)  |
| 74 |    | Tax Category (n)         |   |
|    | 4  | CRC                      | CRC is calculated from 0 to 74 bytes (or to last byte if data).   |

# Tax Categories:

| Start<br>(byte) | Length<br>(byte) | Field                 | Description   |
|-----------------|------------------|-----------------------|---|
| 58              | [1]              | [Tax category ID]     | The first tax category's OrderID, as explained in <u>Tax Rates</u> section (mandatory if <b>Number of tax categories</b> > 0) |
| 59              | [7]              | [Tax category amount] | The first total tax amount for the category specified in  |

|    |     |                       | preceding field <b>Tax category ID</b> (mandatory if <b>Number of tax categories</b> > 0)   |
|----|-----|-----------------------|---|
| 66 | [1] | [Tax category ID]     | The next tax category's OrderID (mandatory if <b>Number of tax categories</b> > 1)  |
| 67 | [7] | [Tax category amount] | The next total tax amount for the category specified in preceding field <b>Tax category ID</b> (mandatory if <b>Number of tax categories</b> > 1) |

### Response data:

| Start (byte) | Length (bytes) | Field                             | Description   |
|--------------|----------------|-----------------------------------|---|
| 0            | 8              | Date/time                         | Same as data sent from E-SDC to SE  |
| 8            | 20             | Taxpayer ID                       | Same as data sent from E-SDC to SE  |
| 28           | 20             | Buyer ID                          | Same as data sent from E-SDC to SE  |
| 48           | 1              | Invoice type                      | Same as data sent from E-SDC to SE  |
| 49           | 1              | Transaction type                  | Same as data sent from E-SDC to SE  |
| 50           | 7              | Invoice amount                    | Same as data sent from E-SDC to SE  |
| 57           | 4              | Sale or refund counter value      | Depends on request's Tax type field   |
| 61           | 4              | Total counter value (sale+refund) | unsigned int 32bit big endian,  |
| 65           | 256 or 512     | Encrypted Internal Data           | Encrypted Internal Data length<br>depends on the number of<br>available tax rates programmed<br>during personalization. It may be<br>256 or 512 bytes long. |
| 321 or 577   | 256            | Digital signature                 |   |
| 577 or 833   | 4              | CRC                               | CRC is calculated from 0 to 577 or 833 bytes.   |

### **Example with CRC:**

### Command Data:

Command Data CRC: 90F2BC39

#### Request:

88130102E0000017BE9B01AB400000000000000050432D3130303030303031000000000000000000

Response: byte array invoice + 4 byte CRC + 9000

## **Amount Status**

Returns 14-bytes-long data structure (7 bytes for sum SALE and REFUND, and 7 bytes for Limit Amount)

# **APDU Request**

| SE<br>Version | IsoCase  | Class | Instruction | P1-P2  | Command<br>Length<br>(Lc) | Command<br>Data | Expected<br>Length<br>(Le) |
|---------------|----------|-------|-------------|--------|---------------------------|-----------------|----------------------------|
| >= 2.0.0      | Case2Sho | 0x88  | 0x14        | 0x0400 | none                      | none            | 0x00                       |

## **APDU** Response

| SE Version | Response Data | SW1SW2 |
|------------|---------------|--------|
| >= 2.0.0   | 14 byte array | 0x9000 |

### **Example:**

Request: 8814040000

Response: 0000724AA18328038D7EA4C68000 9000 (SALE+REFUND=490878370600, Limit

Amount=10000000000000000)

# **Audit**

# **Export TaxCore Public Key**

Returns 259 bytes data structure represents public card key (256 bytes modulus and 3 bytes exponent). This key is used to encrypt Audit packages.

# **APDU Request**

| SE<br>Version | IsoCase  | Class | Instruction | P1-P2  | Command<br>Length<br>(Lc) | Command<br>Data | Expected<br>Length<br>(Le) |
|---------------|----------|-------|-------------|--------|---------------------------|-----------------|----------------------------|
| >= 2.0.0      | Case2Ext | 0x88  | 0x07        | 0x0400 | none                      | none            | 0x000000                   |

## **APDU Response**

| SE Version | Response Data  | SW1SW2 |
|------------|----------------|--------|
| >= 2.0.0   | 259 bytes data | 0x0900 |

### **Example:**

Request: 8807040000000

Response: 256 bytes modulus + 3 bytes exponent + 9000

# **Export Audit Data**

Exports encrypted audit data.

#### **NOTE:**

From the SE version 3.2.5, optionally, CRC can be calculated and used for data verification. If CRC is not used, the command is the same as in the previous applet version.

# **APDU Request**

| SE<br>Version          | IsoCase  | Class | Instruction | P1-P2  | Command<br>Length<br>(Lc) | Command<br>Data | Expected<br>Length<br>(Le) |
|------------------------|----------|-------|-------------|--------|---------------------------|-----------------|----------------------------|
| >= 2.0.0<br>(no CRC)   | Case2Ext | 0x88  | 0x12        | 0x0400 | none                      | none            | 0x000000                   |
| >= 3.2.5<br>(with CRC) | Case2Ext | 0x88  | 0x12        | 0x0102 | none                      | none            | 0x000000                   |

## **APDU Response**

| SE Version          | Response Data         | SW1SW2 |
|---------------------|-----------------------|--------|
| >= 2.0.0 (no CRC)   | 565 or 821 bytes data | 0x9000 |
| >= 3.2.5 (with CRC) | 569 or 825 bytes data | 0x9000 |

### NOTE:

Depending on the Internal Data, the total length of the structure is 565 or 821 bytes. For versions \*\*3.2.5 or later\*\* if CRC is used, the total length can be 569 or 825 if CRC is added.

Exported audit data has the following structure, without CRC:

| Offset     | Length | Data                                     | Note  |
|------------|--------|--|---|
| 0          | 4      | TaxCore Key Version                      |   |
| 4          | 256    | Crypted Internal Data                    | The length of Crypted Internal Data can be 256 or 512 bytes |
| 260 or 516 | 20     | Taxpayer Identification Number (TIN)     |   |
| 280 or 536 | 20     | Buyer ID                                 |   |
| 300 or 556 | 1      | Invoice type                             |   |
| 301 or 557 | 1      | Transaction type                         |   |
| 302 or 558 | 7      | Invoice amount                           |   |
| 309 or 565 | 256    | Digital signature of the above structure |   |

Exported audit data has the following structure, with CRC:

| Offset     | Length | Data                                 | Note   |
|------------|--------|--------------------------------------|--|
| 0          | 4      | TaxCore Key Version                  |  |
| 4          | 256    | Crypted Internal Data                | The length of Crypted Internal Data can<br>be 256 or 512 bytes |
| 260 or 516 | 20     | Taxpayer Identification Number (TIN) |  |
| 280 or 536 | 20     | Buyer ID                             |  |

| 300 or 556 | 1   | Invoice type                             |   |
|------------|-----|--|---|
| 301 or 557 | 1   | Transaction type                         |   |
| 302 or 558 | 7   | Invoice amount                           |   |
| 309 or 565 | 256 | Digital signature of the above structure |   |
| 565 or 821 | 4   | CRC                                      | CRC is calculated from 0 to 565 or 821 bytes. |

### **Example 1 (without CRC):**

Request: 88120400000000

Response: 565 or 821 bytes + 9000

### **Example 2 (with CRC):**

Request: 88120102000000

Response: 569 or 825 bytes + 9000

## **Start Audit**

Notifies the Secure element that the audit process has been initialized by E-SDC.

Secure element returns an encrypted message that shall be submitted to TaxCore as the content of the field auditRequestPayload of audit-proof request.

### **NOTE:**

From the SE version 3.2.5, optionally, CRC can be calculated and used for data verification. If CRC is not used, the command is the same as in the previous applet version.

## **APDU Request**

| SE<br>Version          | IsoCase  | Class | Instruction | P1-P2  | Command<br>Length<br>(Lc) | Command<br>Data | Expected<br>Length<br>(Le) |
|------------------------|----------|-------|-------------|--------|---------------------------|-----------------|----------------------------|
| >= 2.0.0<br>(no CRC)   | Case2Ext | 0x88  | 0x21        | 0x040( | none                      | none            | 0x000000                   |
| >= 3.2.5<br>(with CRC) | Case2Ext | 0x88  | 0x21        | 0x0102 | none                      | none            | 0x000000                   |

## **APDU Response**

| SE Version          | Response Data  | SW1SW2 |
|---------------------|----------------|--------|
| >= 2.0.0 (no CRC)   | 260 bytes data | 0x9000 |
| >= 3.2.5 (with CRC) | 264 bytes data | 0x9000 |

### **Example 1 (without CRC):**

Request: 88210400000000

Response: 260 bytes data + 9000

### **Example 2 (with CRC):**

Request: 88210102000000

Response: 260 bytes data + 4 bytes CRC data + 9000

# **End Audit**

Notifies the Secure element that the audit process has been finalized by TaxCore. If APDU Command status is OK (0x90 0x00) consider the audit operation is completed.

#### **NOTE:**

From the SE version 3.2.5, optionally, CRC can be calculated and used for data verification. If CRC is not used, the command is the same as in the previous applet version.

# **APDU Request**

| SE<br>Version          | IsoCase  | Class | Instruction | P1-P2  | Command<br>Length<br>(Lc) | Command<br>Data                          | Expected<br>Length<br>(Le) |
|------------------------|----------|-------|-------------|--------|---------------------------|--|----------------------------|
| >= 2.0.0<br>(no CRC)   | Case3Ext | 0x88  | 0x20        | 0x0400 | 0x000100                  | 256 bytes<br>received<br>from<br>TaxCore | none                       |
| >= 3.2.5<br>(with CRC) | Case3Ext | 0x88  | 0x20        | 0x0102 | 0x000104                  | 256 bytes<br>received<br>from            | none                       |

|  |  |  |  | TaxCore<br>+ 4 bytes<br>for CRC |  |
|--|--|--|--|---------------------------------|--|
|--|--|--|--|---------------------------------|--|

## **APDU Response**

| SE Version          | Response Data | SW1SW2 |  |
|---------------------|---------------|--------|--|
| >= 2.0.0 (no CRC)   | none          | 0x9000 |  |
| >= 3.2.5 (with CRC) | none          | 0x9000 |  |

### **Example 1 (without CRC):**

#### Command Data:

253AB91A21859A06813E8A880E10BA0C67A09DDBED0B7E001F638CA015D2E414744E0C5C2E0F5F827DFC

#### Request:

8820040000100253AB91A21859A06813E8A880E10BA0C67A09DDBED0B7E001F638CA015D2E414744E0C 9000

### Example 2 (with CRC):

#### Command Data:

253AB91A21859A06813E8A880E10BA0C67A09DDBED0B7E001F638CA015D2E414744E0C5C2E0F5F827DFC

Command Data CRC: CEE700A0

#### Request:

88200102000104253AB91A21859A06813E8A880E10BA0C67A09DDBED0B7E001F638CA015D2E414744E0C 9000

# **Secure Element Specific APDU Error Codes**

This table contains the expected error codes and descriptions that a caller may encounter while working with the Secure Element Applet.

| Error Code | APDU Command | APDU Command Description                             |      |
|------------|--------------|--|------|
| 0x6301     | Sign Invoice | PIN verification required before executing a command | 1500 |
| 0x6302     | Verify PIN   | PIN verification failed – wrong PIN code             | 2100 |

| 0x6303 | Verify PIN   | Wrong PIN size  | 2100        |
|--------|--------------|---|-------------|
| 0x6304 | Sign Invoice | Maximum number of tax categories exceeded   | SDC related |
| 0x6305 | Sign Invoice | Secure Element amount has reached the defined limit. The Secure Element is locked and no additional invoices can be signed before the audit is completed.   | 2210        |
| 0x6306 | End Audit    | End Audit is sent but there is no active Audit  | SDC related |
| 0x6307 | Sign Invoice | Invoice fiscalization is disabled by system   | 2210        |
| 0x6310 | Verify PIN   | The number of allowed PIN entries exceeded  | 2110        |
| 0x63FF | Sign Invoice | A Secure Element counter has reached its limit.<br>The Secure Element must be replaced.   | SDC related |
| 0x6700 | End Audit    | Data must be 256 bytes long   | SDC related |
| 0x6A80 | End Audit    | Proof of Audit command payload provided as APDU Command Data does not match the latest Start Audit one which Secure Element expects. Probably a new Start Audit was initiated after this one was ended. | SDC related |
| 0x6A80 | Sign Invoice | The tax category order id exceeds the maximum allowed for the Secure Element.   | 2310        |
| 0x6F00 | End Audit    | APDU Command Data cannot be recognized as a valid Proof of Audit  | SDC related |