Germany Fiscal Element
JSON Specification

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Safety Precautions

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✎	Describes additional explanation or other useful information.

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About this Manual

Purpose of this Manual

This document describes JSON specifications for developers who develop an application using GermanyFiscalElement of Epson ePOS SDK.

Organization of this Manual

This manual is organized into the following chapters.

Contents

Common Specifications

❏ Character encoding: UTF-8

❏ Line feed code: LF

❏ Escape character: "”" "\" "/" "b" "f" "n" "r" "t" "uXXXX" => Escape with "/ (backslash)"

Data type definition

Data Type	Description
string<n>	String of up to n characters • ASCII characters (0x20 to 0x7E)
string<[n]>	String of n characters • ASCII characters (0x20 to 0x7E)
DateTime	• UTC • Format: YYYY-MM-DDThh:mm:ssZ(ISO8601)
number	Number (valid only in decimal notation)
base64 string	Binary data represented as base64 encoding string
boolean	Boolean value (true or false)
array	Character string represented as an array (string enclosed in [])

JSON message template

[Request]

```
{
   "storage":{
      "type" :"[storage type]",
      "vendor":"[vendor name]"
   }
   "function":"[requested function]",
   "input":{
      "Item1":"[input parameter1]",
      "Item2":"[input parameter2]",
         ......
   },
   "compress":{
      "required":true/false,
      "type":"compression type"
   }
}
```

[Response]

When execution succeeds:

```
{
   "result":"EXECUTION_OK",
   "function":"[requested function]",
   "output":{
      "Item1":"[output parameter1]",
      "Item2":"[output parameter2]"
   }
}
```

When execution fails:

```
{
   "result":"ERROR_EEEEE",
   "function":"[requested function]",
   "output":{
      "Item1":"[output parameter1]",
   },
   "error":{
      "fact":"[fact of error]"
      "errorinfo":"[error info]",
   }
}
```

JSON message common part type definition

Request

Element	Data type	Description
storage	object	Storage Information
- type	string	Storage type • Only "TSE" and "COMMON" are valid • If the storage type is known to be German fiscal element (TSE), specify "TSE" • If the storage type is not known, specify "COMMON" • "COMMON" can be specified for GetStorageInfo only For other functions, returns an error if "COMMON" is specified
- vendor	string	Nickname for storage vendor name • Nickname for German fiscal element (TSE) model. When known to be German fiscal element (TSE), also include the model name • Model name can be acquired with GetStorageInfo • Null character when not German fiscal element (TSE) or not known to be German fiscal element (TSE)
function	string	Request function name For details about the setting, see Functional specifications.
input	object	Input parameters required when request function is executed. For details about the setting, see Functional specifications. (When there is no input data, set an empty object.)
compress	object	Compression setting
- required	boolean	Whether to compress the response data.
- type	string	Compression format when the response data is compressed. (When there is no compression, set a null character.) • Only "zip_deflate" or null character are valid

Response (When execution successful)

Element	Data type	Description
result	string	Execution result • Fixed as "EXECUTION_OK" when execution is successful
function	string	Request function name • Function specified by Request • Null character if the function name is unknown (such as invalid JSON format)
output	object	Parameters output as a result of executing the request function For details about the setting, see Functional specifications. • Returns null characters if there is no parameters output.

Response (When execution fails)

Element	Data type	Description
result	string	Error code corresponding to the error that occurred For the error code list and its contents, refer to Error Code List.
function	string	Request function name • Function specified by Request • Null character if the function name is unknown (such as invalid JSON format)
output	object	Parameters output as a result of executing the request function For details about what is set, refer to Functional specifications. • Returns null characters if there is no parameters output.
error	object	Error details
- fact	string	Cause of error • Error returned by JSON server: target parameter name ↑ refer to Error Code List Error returned by German fiscal element (TSE): null character
- errorinfo	string	Position where the error occurred • Error returned by JSON parser: Error information returned by picojson ↑ JSON message line where error occurred and error location information • Error returned by German fiscal element (TSE): null character

Functional specifications

Configuration

SetUp

Sets up German fiscal element (TSE)

❏ Sets PUK, AdminPIN, and TimeAdminPIN in German fiscal element (TSE)

❏ Internally executes German fiscal element (TSE) unlock (see UnlockTSE), enables export after a CSP test failure in German fiscal element (TSE) (see EnableExportIfCspTestFails), and runs German fiscal element (TSE) self-test.

❏ Initializes German fiscal element (TSE) and makes it ready to use

❏ As this procedure may require a maximum of 60 seconds for processing, set the timeout periods shown below to 120 seconds.

 • Timeout period for operate API of Epson ePOS SDK

 • Timeout period for <type>operate</type> in StorageMessage of ePOS-Device XML

Role

-

Parameters

Input

Name	Type	Description
puk	string<[6]>	New PUK to be set
adminPIN	string<[5]>	New PIN to be set for Admin privileges
timeAdminPin	string<[5]>	New PIN to be set for TimeAdmin privileges

SetUpForPrinter

Start-up after replacing printer

❏ Must be executed whenever the combination of German fiscal element (TSE) and printer is changed

❏ Internally registers the printer serial number as a client ID in German fiscal element (TSE).

❏ Internally runs German fiscal element (TSE) self-test.

[Cautions for SetUp/SetUpForPrinter/RunTSESelfTest]

❏ As this procedure may require a maximum of 60 seconds for processing, set the timeout periods shown below to 120 seconds.

- Timeout period for operate API of Epson ePOS SDK

- Timeout period for <type>operate</type> in StorageMessage of ePOS-Device XML

Role

Admin

RunTSESelfTest

Runs a self-test of the German fiscal element (TSE).

❏ After each power-on, the self-test of German fiscal element (TSE) is necessary before running the other control command for the German fiscal element (TSE).
The self-test checks to see if the internal module of the German fiscal element (TSE) works properly.

❏ The printer automatically runs the self-test of German fiscal element (TSE) after each power-on, so basically, the user does not need to run the self-test manually.
However, if the printer is used for 25 hours or longer without being turned off, the user needs to run the self-test using this function before the time for continuous run of the printer reaches 25 hours.

❏ To acquire the remaining time before the self-test is required, use "timeUntilNextSelfTest" of GetStorageInfo.

[Cautions for SetUp/SetUpForPrinter/RunTSESelfTest]

❏ As this procedure may require a maximum of 60 seconds for processing, set the timeout periods shown below to 120 seconds.

- Timeout period for operate API of Epson ePOS SDK

- Timeout period for <type>operate</type> in StorageMessage of ePOS-Device XML

Role

-

RegisterSecretKey

Registers the secret key

❏ Registers the key used to calculate the hash value required for user/host authentication when logging in.

❏ This setting is persisted across power cycles.

Role

Admin

Parameters

Input

Name	Type	Description
secretKey	string<[8]>	Secret key used to calculate the hash value for user/host authentication • Default value is "EPSONKEY". • The secret key must be registered (default value changed) after installation or when replacing the printer.

UpdateTime

Updates the German fiscal element (TSE) time

❏   Updates the German fiscal element (TSE) time using the UTC time specified from POS

❏   This function (or UpdateTimeForFirst) must be executed before starting to write transactions.

Role

Admin/TimeAdmin

Parameters

Input

Name	Type	Description
userId	string<30>	Administrator logged in with Admin privileges Or Client ID logged in with TimeAdmin privileges
newDateTime	DateTime	Date and time specified from POS to synchronize German fiscal element (TSE) and POS date and time • UTC specification Format is ISO 8601 extended format - YYYY-MM-DDThh:mm:ssZ • Only year 2000 and after are valid
useTimeSync	boolean	If German fiscal element (TSE) supports time synchronization, specify whether to use this function. true: use time synchronization false: do not use time synchronization • Fixed to false if German fiscal element (TSE) model is "TSE1"

UpdateTimeForFirst

Updates the German fiscal element (TSE) time

❏ Updates the German fiscal element (TSE) time using the UTC time specified from POS
  - Actually update the German fiscal element (TSE) time only when called the first time
  - Skip updating the German fiscal element (TSE) time when called the second and subsequent times per power-cycle

❏ This function (or UpdateTime) must be executed before starting to write transactions.

Role

Admin/TimeAdmin

Parameters

Input

Name	Type	Description
userId	string<30>	Administrator logged in with Admin privileges Or Client ID logged in with TimeAdmin privileges

newDateTime	DateTime	Date and time specified from POS to synchronize German fiscal element (TSE) and POS date and time
		• UTC specification
		  Format is ISO 8601 extended format
		  YYYY-MM-DDThh:mm:ssZ
		• Only year 2000 and after are valid

useTimeSync	boolean	If German fiscal element (TSE) supports time synchronization, specify whether to use this function. 　true: use time synchronization 　false: do not use time synchronization • Fixed to false if German fiscal element (TSE) model is "TSE1"

RegisterClient

Registers client IDs to be used in German fiscal element (TSE)

❑ 100 client IDs can be registered in German fiscal element (TSE).

   However, as one ID is used internally by the printer, 99 client IDs can be registered by the user.

❑ Only client IDs registered in German fiscal element (TSE) can be used for transactions.

Role

Admin

Parameters

Input

Name	Type	Description
clientId	string<30>	Client ID to be registered • The string must be representable as an ASN.1 PrintableString, which restricts the allowed characters to the following: A-Za-z0-9'()+,-./:=? and the space character. • As strings that include "EPSON" are reserved by the printer, registration by the user is prohibited.

DeregisterClient

Deregisters client IDs registered in German fiscal element (TSE)

Role

Admin

Parameters

Input

Name	Type	Description
clientId	string<30>	Client ID to be deregistered • As strings that include "EPSON" are reserved by the printer, deleting by the user is prohibited.

GetRegisteredClientList

Acquires a list of client IDs registered in German fiscal element (TSE)

❏ Although the client ID "EPSONXXXXXXXX" is included, the XXXXXXXX part used inside the printer is the printer serial number.

Role

Admin

Parameters

Output

Name	Type	Description
registeredClientIdList	array	List of client IDs registered in German fiscal element (TSE) Example: {"registeredClientIdList":[POS1]}

UnlockTSE

Unlocks German fiscal element (TSE)

❏ Transactions and export functions are not available when German fiscal element (TSE) is locked.
In fact, only functions belonging to User Authentication can be used.

❏ This setting is persisted across power cycles.

Role

Admin

LockTSE

Locks German fiscal element (TSE)

❏ Transactions and export functions are not available when German fiscal element (TSE) is locked.
In fact, only functions belonging to User Authentication can be used.

❏ This setting is persisted across power cycles.

Role

Admin

SetTimeOutInterval

Sets the timeout period.

❏ This setting is persisted across power cycles.

Role

Admin

Parameters

Input

Name	Type	Description
timeoutIntervalForAdmin	number	Timeout period for Admin auto lockout • Optional parameter This setting is valid when specified. • Valid range: 900 to 7200 [sec] (15 minutes to 2 hours) • Default value 900 [sec]
timeoutIntervalForTimeAdmin	number	Timeout period for TimeAdmin auto lockout • Optional parameter This setting is valid when specified. • Valid range: 900 to 86400 [sec] (15 minutes to 24 hours) • Default value 28800 [sec]
timeoutIntervalForExport	number	Export timeout period • Optional parameter This setting is valid when specified. • Valid range: 100 to 330 [sec] • Default value 100 [sec]

GetTimeOutInterval

Acquires the timeout period.

❏ This setting is persisted across power cycles.

Role

Admin

Parameters

Output

Name	Type	Description
timeoutIntervalForAdmin	number	Timeout period for Admin auto lockout • Valid range: 900 to 7200 [sec] (15 minutes to 2 hours) • Default value 900 [sec]
timeoutIntervalForTimeAdmin	number	Timeout period for TimeAdmin auto lockout • Valid range: 900 to 86400 [sec] (15 minutes to 24 hours) • Default value 28800 [sec] (8 hours)
timeoutIntervalForExport	number	Export timeout period • Valid range: 100 to 330 [sec] • Default value 100 [sec]

EnableExportIfCspTestFails

Enables log data in German fiscal element (TSE) to be exported even if the CSP (Crypto Service Provider) test fails.

* The CSP test is executed in German fiscal element (TSE) self-test.

❏ If the CSP test fails due to a security module failure, log data cannot be exported by default.

❏ Only ArchiveExport can be executed with this command. (Filter-related exports cannot be executed.)

❏ This setting will only succeed after a successful German fiscal element (TSE) self-test (which includes the CSP test). Once the CSP test fails, this value cannot be changed anymore.

❏ This setting is persisted across power cycles.

Role

Admin

DisableExportIfCspTestFails

Disables log data in German fiscal element (TSE) to be exported if the CSP (Crypto Service Provider) test fails.

❏ This setting will only succeed after a successful German fiscal element (TSE) self-test (which includes the CSP test). Once the CSP test fails, this value cannot be changed anymore.

❏ This setting is persisted across power cycles.

Role

Admin

DisableSecureElement

Disables German fiscal element (TSE) use

❏ New transactions cannot be written after executing this function.

❏ Can be executed only when no incomplete transactions exist.

Role

Admin

User Authentication

AuthenticateUserForAdmin

Log in to German fiscal element (TSE) with Admin privileges (user authentication)

❏ Enables the use of functions whose "Role" is Admin (Admin privileges).

❏ Automatically log out when left (Admin privilege function not used) for a certain time (default 15 minutes). This timeout period can be set using SetTimeOutInterval.

Role

-

Parameters

Input

Name	Type	Description
userId	string<30>	User ID logged in with Admin privileges Only "Administrator" is valid
pin	string<[5]>	PIN for Admin privileges
hash	base64 string	Hash value for host authentication

Output

Name	Type	Description

remainingRetries	number	Number of input PIN/PUK retries remaining
		• PIN/PUK authentication can fail up to 3 times.
		• Not returned when PIN/PUK authentication is successful
		• Reduces by 1 on each PIN/PUK authentication failure
		  - Number of retries is reduced only when PIN/PUK authentication fails.
		  - Number of retries is not reduced in other errors.

AuthenticateUserForTimeAdmin

Log in to German fiscal element (TSE) with TimeAdmin privileges (user authentication)

❏ Enables the use of functions whose "Role" is TimeAdmin (TimeAdmin privileges).

❏ Automatically log out when left (TimeAdmin privilege function not used) for a certain time (default 8 hours). This timeout period can be set using SetTimeOutInterval.

Role

-

Parameters

Input

Name	Type	Description
clientId	string<30>	Client ID to log in with TimeAdmin privileges • Only client IDs registered in German fiscal element (TSE) are valid. * Register client IDs in German fiscal element (TSE) using RegisterClient.
pin	string<[5]>	PIN for TimeAdmin privileges
hash	base64 string	Hash value for host authentication

Output

Name	Type	Description

remainingRetries	number	Number of input PIN/PUK retries remaining
		• PIN/PUK authentication can fail up to 3 times.
		• Not returned when PIN/PUK authentication is successful
		• Reduces by 1 on each PIN/PUK authentication failure
		  - Number of retries is reduced only when PIN/PUK authentication fails.
		  - Number of retries is not reduced in other errors.

LogOutForAdmin

Logs out a user logged in with Admin privileges

Role

Admin

LogOutForTimeAdmin

Logs out a client logged in with TimeAdmin privileges

Role

TimeAdmin

Parameters

Input

Name	Type	Description
clientId	string<30>	Client ID logged in with TimeAdmin privileges

UnblockUserForAdmin

Unblocks the PIN for Admin privileges

❏ This function is only available for hosts authenticated using AuthenticateHost.

❏ If PUK is blocked, it cannot be recovered. The only way to recover is to replace German fiscal element (TSE).

Role

Host authenticated using AuthenticateHost

Parameters

Input

Name	Type	Description
userId	string<30>	User ID of authenticated host • Only "Administrator" is valid
puk	string<[6]>	PUK
newPin	string<[5]>	PIN for Admin privileges • Only valid when PIN (new PIN) differs from current PIN

Output

Name	Type	Description

remainingRetries	number	Number of input PIN/PUK retries remaining
		• PIN/PUK authentication can fail up to 3 times.
		• Not returned when PIN/PUK authentication is successful
		• Reduces by 1 on each PIN/PUK authentication failure
		  - Number of retries is reduced only when PIN/PUK authentication fails.
		  - Number of retries is not reduced in other errors.

UnblockUserForTimeAdmin

Unblocks the PIN for TimeAdmin privileges

❏ This function is only available for hosts authenticated using AuthenticateHost.

❏ If PUK is blocked, it cannot be recovered. The only way to recover is to replace German fiscal element (TSE).

Role

Host authenticated using AuthenticateHost

Parameters

Input

Name	Type	Description
userId	string<30>	User ID of authenticated host • Only "Administrator" is valid
puk	string<[6]>	PUK
newPin	string<[5]>	PIN for TimeAdmin privileges • Only valid when PIN (new PIN) differs from current PIN

Output

Name	Type	Description

remainingRetries	number	Number of input PIN/PUK retries remaining
		• PIN/PUK authentication can fail up to 3 times.
		• Not returned when PIN/PUK authentication is successful
		• Reduces by 1 on each PIN/PUK authentication failure
		  - Number of retries is reduced only when PIN/PUK authentication fails.
		  - Number of retries is not reduced in other errors.

GetChallenge

Acquires the challenge

❏ Acquires the challenge data used to calculate the hash value required for user/host authentication when logging in.

Role

-

Parameters

Input

Name	Type	Description
userId	string<30>	User ID or client ID of logged-in (authenticated) host • The string must be representable as an ASN.1 PrintableString, which restricts the allowed characters to the following: A-Za-z0-9'()+,-./:=? and the space character.

Output

Name	Type	Description
challenge	string<[16]>	Random string for each specified user ID

AuthenticateHost

Authenticates the host

❏ This function (host authentication) must be executed before using the following functions.

- ChangePuk

- UnblockUserForAdmin

- UnblockUserForTimeAdmin

Role

-

Parameters

Input

Name	Type	Description
userId	string<30>	User ID of host to be authenticated • Only "Administrator" is valid
hash	base64 string	Hash value for host authentication

DeauthenticateHost

Cancels host authentication.

❏ Logs out of a host logged into (authenticated) with AuthenticateHost

Role

Host authenticated using AuthenticateHost

Parameters

Input

Name	Type	Description
userId	string<30>	User ID of authenticated host • Only "Administrator" is valid

GetAuthenticatedUserList

Acquires a list of logged-in (authenticated) user IDs and client IDs.

Role

Admin

Parameters

Input

Name	Type	Description
userRole	string<30>	Type of user privileges • Only "Admin" or "TimeAdmin" are valid

Output

Name	Type	Description
authenticatedUserList	array	List of logged-in user IDs Example: {"authenticatedUserList":[POS1, POS2]}}

ChangePuk

Changes PUK

❏ This function is only available for hosts authenticated using AuthenticateHost.

❏ If PUK is blocked, it cannot be recovered. The only way to recover is to replace German fiscal element (TSE).

Role

Host authenticated using AuthenticateHost

Parameters

Input

Name	Type	Description
userId	string<30>	User ID of authenticated host Only "Administrator" is valid
oldPuk	string<[6]>	Current PUK
newPuk	string<[6]>	New PUK to be set

Output

Name	Type	Description
remainingRetries	number	Number of input PIN/PUK retries remaining • PIN/PUK authentication can fail up to 3 times. • Not returned when PIN/PUK authentication is successful • Reduces by 1 on each PIN/PUK authentication failure - Number of retries is reduced only when PIN/PUK authentication fails. - Number of retries is not reduced in other errors.

ChangePinForAdmin

Changes the Admin PIN

Role

Admin

Parameters

Input

Name	Type	Description
oldPin	string<[5]>	Current AdminPIN
newPin	string<[5]>	New AdminPIN to be set

Output

Name	Type	Description
remainingRetries	number	Number of input PIN/PUK retries remaining • PIN/PUK authentication can fail up to 3 times. • Not returned when PIN/PUK authentication is successful • Reduces by 1 on each PIN/PUK authentication failure - Number of retries is reduced only when PIN/PUK authentication fails. - Number of retries is not reduced in other errors.

ChangePinForTimeAdmin

Changes the TimeAdmin PIN

Role

TimeAdmin

Parameters

Input

Name	Type	Description
clientId	string<30>	Client ID logged in with TimeAdmin privileges
oldPin	string<[5]>	Current TimeAdminPIN
newPin	string<[5]>	New TimeAdminPIN to be set

Output

Name	Type	Description
remainingRetries	number	Number of input PIN/PUK retries remaining • PIN/PUK authentication can fail up to 3 times. • Not returned when PIN/PUK authentication is successful • Reduces by 1 on each PIN/PUK authentication failure - Number of retries is reduced only when PIN/PUK authentication fails. - Number of retries is not reduced in other errors.

Transaction

StartTransaction

Starts a transaction

Role

TimeAdmin

Parameters

Input

Name	Type	Description
clientId	string<30>	Client ID logged in with TimeAdmin privileges • Only client IDs registered in German fiscal element (TSE) are valid * Client IDs are registered in German fiscal element (TSE) using RegisterClient.
processData	base64 string	Transaction data • The contents of the data is decided by the app.
processType	string<100>	Transaction type • The string must be representable as an ASN.1 PrintableString, which restricts the allowed characters to the following: A-Za-z0-9'()+,-./:=? and the space character. • The contents of the data is decided by the app.
additionalData	base64 string	Additional data • The contents of the data is decided by the app. • Invalid for German fiscal element (TSE) model "TSE1" = Set value is ignored => Null character specification recommended

Output

Name	Type	Description
transactionNumber	number	Transaction number • Valid range: range of unsigned long int type
logTime	DateTime	Date and time that the log was created • UTC specification Format is ISO 8601 extended format - YYYY-MM-DDThh:mm:ssZ

Name	Type	Description
serialNumber	base64 string	German fiscal element (TSE) serial number • Hash value of public key used to generate signature
signatureCounter	number	Current signature counter • Valid range: range of unsigned long int type
signature	base64 string	Signature value

UpdateTransaction

Updates a transaction

Role

TimeAdmin

Parameters

Input

Name	Type	Description
clientId	string<30>	Client ID logged in with TimeAdmin privileges • Only client IDs registered in German fiscal element (TSE) are valid * Client IDs are registered in German fiscal element (TSE) using RegisterClient.
transactionNumber	number	Transaction number of the started transaction • The transaction number returned as output of StartTransaction is used • Valid range: Range of unsigned long int type
processData	base64 string	Transaction data • The contents of the data is decided by the app.
processType	string<100>	Transaction type • The string must be representable as an ASN.1 PrintableString, which restricts the allowed characters to the following: A-Za-z0-9'()+,-./:=? and the space character. • The contents of the data is decided by the app.

Output

Name	Type	Description
logTime	DateTime	Date and time that the log was created • UTC specification Format is ISO 8601 extended format - YYYY-MM-DDThh:mm:ssZ
signatureCounter	number	Current signature counter • Valid range: range of unsigned long int type
signature	base64 string	Signature value

FinishTransaction

Ends a transaction

Role

TimeAdmin

Parameters

Input

Name	Type	Description
clientId	string<30>	Client ID logged in with TimeAdmin privileges • Only client IDs registered in German fiscal element (TSE) are valid * Client IDs are registered in German fiscal element (TSE) using RegisterClient.
transactionNumber	number	Transaction number of the started transaction • The transaction number returned as output of StartTransaction is used • Valid range: Range of unsigned long int type
processData	base64 string	Transaction data • The contents of the data is decided by the app.
processType	string<100>	Transaction type • The string must be representable as an ASN.1 PrintableString, which restricts the allowed characters to the following: A-Za-z0-9'()+,-./:=? and the space character. • The contents of the data is decided by the app.
additionalData	base64 string	Additional data • The contents of the data is decided by the app. • Invalid for German fiscal element (TSE) model "TSE1" = Set value is ignored => Null character specification recommended

Output

Name	Type	Description
logTime	DateTime	Date and time that the log was created • UTC specification Format is ISO 8601 extended format - YYYY-MM-DDThh:mm:ssZ
signatureCounter	number	Current signature counter • Valid range: range of unsigned long int type
signature	base64 string	Signature value

GetStartedTransactionList

Acquires a list of started (incomplete*) transactions.

* The incomplete status is the status where FinishTransaction has not been executed for a transaction that was started with StartTransaction.

Role

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Parameters

Input

Name	Type	Description
clientId	string<30>	Client ID of started transaction • When an empty string "" is specified, a list of transaction numbers of all incomplete transactions is returned regardless of the client ID.

Output

Name	Type	Description
startedTransactionNumberList	array	List of transaction numbers of incomplete transactions and the associated client IDs Example: {"startedTransactionNumberList":[2,5]}

GetLastTransactionResponse

Gets the result of the last transaction stored in German fiscal element (TSE) for each client ID

Role

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Parameters

Input

Name	Type	Description
clientId	string<30>	Client ID of the latest transaction result • When an empty string "" is specified, the latest transaction result is returned regardless of the client ID.

Output

Name	Type	Description
logTime	DateTime	Date and time that the latest transaction log corresponding to the specified client ID was generated • UTC specification Format is ISO 8601 extended format - YYYY-MM-DDThh:mm:ssZ
signatureCounter	number	Signature counter of the latest transaction log corresponding to the specified client ID • Valid range: range of unsigned long int type
transactionNumber	number	Transaction counter of the latest transaction corresponding to the specified client ID • Valid range: range of unsigned long int type
signature	base64 string	Signature value
serialNumber	base64 string	German fiscal element (TSE) serial number • Hash value of public key used to generate signature

Export

ArchiveExport

Starts archive export

❏ Acquires all log data saved in German fiscal element (TSE) in TAR file format

❏ After exporting starts, the printer enters export status and only the following commands can be accepted.
- GetExportData
- FinalizeExport
- CancelExport

❏ Exporting cannot be restarted while in export status.

❏ Before starting exporting, the German fiscal element (TSE) time must be updated by executing UpdateTime or UpdateTimeForFirst.

❏ In export status, automatically log out when left (GetExportData not used) for a certain time (default 90 minutes).
This timeout period can be set using SetTimeOutInterval.

❏ In the case of archive export, all log data can be deleted from German fiscal element (TSE) using FinalizeExport after confirming that all data has been acquired.

[Cautions during export]

❏ The time required to export depends on the amount of data and the interface.

❏ Check that the smart device is charged sufficiently.

❏ Check that no errors have occurred in the printer.

❏ Check that the printer's communication status is in good condition while exporting.

❏ Do not turn off the printer while exporting.

❏ Do not disconnect the connection cable and power cable while exporting.

❏ Do not sleep the smart device while exporting.

❏ If data is not received properly while exporting due to an error such as disconnected communication, the exported data may be invalid, and CancelExport must be executed to start exporting again.

Role

Admin

Parameters

Output

Name	Type	Description
tarExportSize	number	Size when acquiring all log data in TAR file format • Valid range: range of unsigned long int type

ExportFilteredByTransactionNumber

Starts exporting the specified transaction number

❏ Acquires the specified target log saved in German fiscal element (TSE) in TAR file format

❏ As data in German fiscal element (TSE) cannot be deleted by this export function, it is not used for archiving but to acquire a log when an export is requested by an auditor.

❏ After exporting starts, the printer enters export status and only the following commands can be accepted.
- GetExportData
- FinalizeExport
- CancelExport

❏ Exporting cannot be restarted while in export status.

❏ Before starting exporting, the German fiscal element (TSE) time must be updated by executing UpdateTime or UpdateTimeForFirst.

❏ In export status, automatically log out when left (GetExportData not used) for a certain time (default 90 minutes).
This timeout period can be set using SetTimeOutInterval.

[Cautions during export]

❏ The time required to export depends on the amount of data and the interface.

❏ Check that the smart device is charged sufficiently.

❏ Check that no errors have occurred in the printer.

❏ Check that the printer's communication status is in good condition while exporting.

❏ Do not turn off the printer while exporting.

❏ Do not disconnect the connection cable and power cable while exporting.

❏ Do not sleep the smart device while exporting.

❏ If data is not received properly while exporting due to an error such as disconnected communication, the exported data may be invalid, and CancelExport must be executed to start exporting again.

Role

Admin

Parameters

Input

Name	Type	Description
clientId	string<30>	Client ID to be exported • Only the log associated with the specified client ID is to be exported. • When an empty string "" is specified, the log of all client IDs is to be exported.
transactionNumber	number	Transaction number • Valid range: range of unsigned long int type

ExportFilteredByTransactionNumberInterval

Starts exporting with the specified transaction number range

❏ Acquires the specified target log saved in German fiscal element (TSE) in TAR file format

❏ As data in German fiscal element (TSE) cannot be deleted by this export function, it is not used for archiving but to acquire a log when an export is requested by an auditor.

❏ After exporting starts, the printer enters export status and only the following commands can be accepted.
- GetExportData
- FinalizeExport
- CancelExport

❏ Exporting cannot be restarted while in export status.

❏ Before starting exporting, the German fiscal element (TSE) time must be updated by executing UpdateTime or UpdateTimeForFirst.

❏ In export status, automatically log out when left (GetExportData not used) for a certain time (default 90 minutes).
This timeout period can be set using SetTimeOutInterval.

[Cautions during export]

❏ The time required to export depends on the amount of data and the interface.

❏ Check that the smart device is charged sufficiently.

❏ Check that no errors have occurred in the printer.

❏ Check that the printer's communication status is in good condition while exporting.

❏ Do not turn off the printer while exporting.

❏ Do not disconnect the connection cable and power cable while exporting.

❏ Do not sleep the smart device while exporting.

❏ If data is not received properly while exporting due to an error such as disconnected communication, the exported data may be invalid, and CancelExport must be executed to start exporting again.

Role

Admin

Parameters

Input

Name	Type	Description
clientId	string<30>	Client ID to be exported • Only the log associated with the specified client ID is to be exported. • When an empty string "" is specified, the log of all client IDs is to be exported.
startTransactionNumber	number	Start number of specified transaction numbers • Valid range: range of unsigned long int type

Name	Type	Description
endTransactionNumber	number	End number of specified transaction numbers • Valid range: range of unsigned long int type • startTransactionNumber ≤ Must be endTransactionNumber

ExportFilteredByPeriodOfTime

Starts exporting for a specified date and time range

❏ Acquires the specified target log saved in German fiscal element (TSE) in TAR file format

❏ As data in German fiscal element (TSE) cannot be deleted by this export function, it is not used for archiving but to acquire a log when an export is requested by an auditor.

❏ After exporting starts, the printer enters export status and only the following commands can be accepted.
  - GetExportData
  - FinalizeExport
  - CancelExport

❏ Exporting cannot be restarted while in export status.

❏ Before starting exporting, the German fiscal element (TSE) time must be updated by executing UpdateTime or UpdateTimeForFirst.

❏ In export status, automatically log out when left (GetExportData not used) for a certain time (default 90 minutes).
  This timeout period can be set using SetTimeOutInterval.

[Cautions during export]

❏ The time required to export depends on the amount of data and the interface.

❏ Check that the smart device is charged sufficiently.

❏ Check that no errors have occurred in the printer.

❏ Check that the printer's communication status is in good condition while exporting.

❏ Do not turn off the printer while exporting.

❏ Do not disconnect the connection cable and power cable while exporting.

❏ Do not sleep the smart device while exporting.

❏ If data is not received properly while exporting due to an error such as disconnected communication, the exported data may be invalid, and CancelExport must be executed to start exporting again.

Role

Admin

Parameters

Input

Name	Type	Description
clientId	string<30>	Client ID to be exported • Only the log associated with the specified client ID is to be exported. • When an empty string "" is specified, the log of all client IDs is to be exported.

Name	Type	Description

startDate	DateTime	Start date and time of specified log time
		• UTC specification
		  Format is ISO 8601 extended format
		  - YYYY-MM-DDThh:mm:ssZ

endDate	DateTime	End date and time of specified log time
		• UTC specification
		  Format is ISO 8601 extended format
		  - YYYY-MM-DDThh:mm:ssZ
		• startDate
		  ≤ Must be endDate

GetExportData

Acquires exported data

❑ If exportStatus was not "EXPORT_COMPLETE", acquisition of all log data is not complete and GetExportData must be executed again.

❑ If exportStatus was "EXPORT_COMPLETE", acquisition of all log data is complete and it is not necessary to execute GetExportData again. Execute FinalizeExport.

❑ Each time data is acquired, it is Base64 decoded into binary data.
All this binary data must be concatenated and saved as a single TAR file.

Role

Admin

Parameters

Output

Name	Type	Description
exportData	base64 string	Data exported (from German fiscal element (TSE)) • Character string of up to 128 KB binary data that is Base64 encoded • While German fiscal element (TSE) is searching the target data, an empty string is returned.
exportStatus	string<100>	Whether all the specified log data has been acquired "EXPORT_COMPLETE" : all specified log data has been acquired "EXPORT_INCOMPLETE" : all specified log data has not yet been acquired and the target data is being collected "EXPORT_INCOMPLETE_SEARCHING" : all specified log data has not been acquired and the target data is being searched

FinalizeExport

Ends exporting

❏ This can be executed only when all export target data has been acquired using GetExportData.

❏ This procedure clears the export status.

❏ If deleteData is set to true, all the log data in German fiscal element (TSE) is deleted.

Role

Admin

Parameters

Input

Name	Type	Description

deleteData	boolean	Whether to delete all log data in German fiscal element (TSE)
		
		  true: delete
		
		  false: do not delete
		
		• Only valid for ArchiveExport
		
		• Invalid for functions other than ArchiveExport

CancelExport

Cancels exporting

❏ This procedure clears the export status.

Role

Admin

GetLogMessageCertificate

Acquires the public key for the signature

Acquires the certificate that can be used to verify the signatures of all Log Messages created by the German fiscal element (TSE).

❏ The returned data is a single PEM file, which contains multiple certificates, since the TSE's certificate is signed by other certificates.

❏ To verify the signature, only the leaf certificate (the first one in the PEM file) is required.

❏ To make sure the leaf certificate is genuine, the next certificate in the file can be used to verify the previous certificate until the last certificate is about to be checked, which will be the root certificate that must be trusted by the system.

Role

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Parameters

Output

Name	Type	Description
logMessageCertificate	base64 string	The certificate that can be used to verify the signatures of all Log Messages created by the German fiscal element (TSE).

Information

GetStorageInfo

Acquires German fiscal element (TSE) information

Role

-

Parameters

Output

Name	Type	Description
vendorType	string<100>	German fiscal element (TSE) model name
tseInformation	-	Object
tseCapacity	number	German fiscal element (TSE) capacity • Valid range: range of unsigned long int type • Units: blocks. 1Block = 512 Byte
tseCurrentSize	number	German fiscal element (TSE) size used • Valid range: range of unsigned long int type • Units: blocks. 1Block = 512 Byte. • Returns a correct value only when the German fiscal element (TSE) has been unlocked, and the self-test has been done. Returns 0 except for that.
tseInitializationState	string<100>	German fiscal element (TSE) initialization status • "UNINITIALIZED" : uninitialized status • "INITIALIZED" : initialized status • "DECOMMISSIONED" : cannot be used
hasValidTime	boolean	Whether a valid time is set in German fiscal element (TSE) (whether UpdateTime has been executed) true: valid time set false: valid time not set • A transaction can be started only if a valid time has been set.

Name	Type	Description
hasPassedSelfTest	boolean	Whether the German fiscal element (TSE) passed its self-test. true: German fiscal element (TSE) self-test has passed false: German fiscal element (TSE) self-test has not passed
timeUntilNextSelfTest	number	The timeout in seconds after which the next self test must be run. • If this reaches 0, all following commands will fail until the self test is executed again. • This time will only change after the first time update on the German fiscal element (TSE). • Valid range: range for "unsigned int" type
isExportEnabledIfCspTestFails	boolean	Whether data export is enabled if the CSP test failed. true: data export is enabled if the CSP test failed false: data export is disabled if the CSP test failed
maxUpdateDelay	number	Interval (in seconds) after which a started transaction must have received an update in case new data is available on the cash register. This is currently set to 45 seconds according to MAX_UPDATE_DELAY from [BSI-TR-03116-5].
startedTransactions	number	Number of transactions that have not been finished, yet. If this equals Max Started Transactions, no new transactions can be started until at least one transaction has been finished. • Valid range: 0 to 512 • Returns the correct value only when German fiscal element (TSE) is unlocked
maxStartedTransactions	number	Maximum number of started transactions, i.e. amount of transactions that can be started in parallel. • Maximum value 512
createdSignatures	number	Amount of signatures that have been created with this German fiscal element (TSE). • Valid range: 0 to 10000000
remainingSignatures	number	Remaining amount of signatures • Valid range: 0 to 10000000
maxSignatures	number	Maximum amount of signatures that can be created with this German fiscal element (TSE). • Maximum value 10000000

Name	Type	Description
registeredClients	number	The number of clients that is currently registered clients. • Valid range: 0 to 100 • However, as one client ID is used by the printer, up to 99 client IDs can be registered by the user.
maxRegisteredClients	number	Maximum number of clients that can be registered. • Maximum value 100 • However, as one client ID is used by the printer, up to 99 client IDs can be registered by the user.
certificateExpirationDate	DateTime	Timestamp after which the certificate of this German fiscal element (TSE) will be invalid. As the German fiscal element (TSE) will not be usable afterwards, all data must have been properly exported before this date. • UTC specification Format is ISO 8601 extended format - YYYY-MM-DDThh:mm:ssZ
tarExportSize	number	Size of the whole German fiscal element (TSE) Store in bytes, if exported. • Valid range: range of unsigned long int type • Units: bytes • Returns a correct value only when the German fiscal element (TSE) has been unlocked, and the self-test has been done. Returns 0 except for that.
isTransactionInProgress	boolean	Whether a transaction is currently in progress. true: a transaction is currently in progress false: a transaction is not currently in progress
isTSEUnlocked	boolean	German fiscal element (TSE) lock status * Transactions and export functions are not available when the German fiscal element (TSE) is locked. true: German fiscal element (TSE) is unlocked false: German fiscal element (TSE) is locked • This will only be true, if the German fiscal element (TSE) has been unlocked and the self test has been successful.
serialNumber	base64 string	Raw SHA-256 hash over the public key that belongs to the private key generating signatures. This can be used as German fiscal element (TSE) unique ID.

Name	Type	Description
tsePublicKey	base64 string	The public key that belongs to the private key generating signatures,formatted according to [BSI TR-03111]. This key can be used to verify all signatures created by the German fiscal element (TSE).
signatureAlgorithm	string<100>	The signature algorithm that is used by the German fiscal element (TSE).
tseDescription	string<128>	ASCII string containing the certificate ID issued by BSI to prove TR-03153 compliance.
softwareVersion	number	The German fiscal element (TSE)'s software version
hardwareVersion	number	The German fiscal element (TSE)'s hardware version
cdcId	string<18>	This is a unique identifier created by Epson to track a specific German fiscal element (TSE).
cdcHash	string<64>	This will be used to confirm integrity of the data.

lastExportExecutedDate	DateTime	Date and time of the last export
		* Date and time that FinalizeExport was last executed successfully.
		• UTC specification
		  Format is ISO 8601 extended format
		  - YYYY-MM-DDThh:mm:ssZ

smartInformation	-	Object
spareBlockStatus	-	Object
healthStatus	string<64>	Available values are as follows: • "DEAD" when the value of remainingSpareBlocks is less than 25 • "WARNING" when the value of remainingSpareBlocks is less than 30 • "PASS" when the value of remainingSpareBlocks is other than the above • Returns a correct value only when the self-test has been done. Returns "UNKNOWN" except for that.
remainingSpareBlocks	number	Percentage of remaining spare blocks. • Valid range: 0 to 100 • Returns a correct value only when the self-test has been done. Returns 100 except for that.
eraseLifetimeStatus	-	• Object

Name	Type	Description
healthStatus	string<64>	Available values are as follows: • "DEAD" when the value of remainingEraseC-ounts is less than 2 • "WARNING" when the value of remainingErase-Counts is less than 10 • "PASS" when the value of remainingEraseC-ounts is other than the above • Returns a correct value only when the self-test has been done. Returns "UNKNOWN" except for that.
remainingEraseCounts	number	Percentage of remaining erase counts. • Valid range: 0 to 100 • Returns a correct value only when the self-test has been done. Returns 100 except for that.
dataIntegrity	-	• Object
healthStatus	string<64>	Available values are as follows: • "DEAD" when the value of uncorrectableECCEr-rors is 1 or higher • "PASS" when the value of uncorrectableECCEr-rors is 0 • Returns a correct value only when the self-test has been done. Returns "UNKNOWN" except for that.
uncorrectableECCErrors	number	Shows the number of uncorrectable(unrecover-able) ECC errors that occurred on read com-mands. • Valid range: range of unsigned short int type • Returns a correct value only when the self-test has been done. Returns 0 except for that.
remainingTenYearsDataRetention	number	Percentage of remaining erase counts until the ten year data retention can not be guaranteed anymore. • Valid range: 0 to 100 • Returns a correct value only when the self-test has been done. Returns 0 except for that.

Name	Type	Description
isReplacementNeeded	boolean	Whether the German fiscal element (TSE) should be replaced with a new one based on the current flash health. true: German fiscal element (TSE) should be replaced false: German fiscal element (TSE) does not need to be replaced * Set to true when tseHealth is "DEAD". • Returns a correct value only when the self-test has been done. Returns false except for that.
tseHealth	string<64>	Available values are as follows: • "DEAD" when "healthStatus" in any one of "spareBlockStatus", "eraseLifetimeStatus", or "dataIntegrity" is "DEAD". • "WARNING" when "healthStatus" in each of "spareBlockStatus", "eraseLifetimeStatus", and "dataIntegrity" is not "DEAD" and "healthStatus" in any one of the above is "WARNING". • "PASS" when "healthStatus" in "spareBlockStatus", "eraseLifetimeStatus", and "dataIntegrity" is all "PASS". • Returns a correct value only when the self-test has been done. Returns "UNKNOWN" except for that.

Error Code List

From Printer

Error Code	Condition
JSON_ERROR_NOT_ENOUGH_CONTENTS	Inadequate JSON message contents (missing parameter, etc.)
JSON_ERROR_UNEXPECTED_PARAM_TYPE	Incorrect JSON message parameter data type
JSON_ERROR_OVER_DATA_SIZE	JSON message size exceeds the maximum value supported (64 KB)
JSON_ERROR_INVALID_PARAMETER_RANGE	JSON message parameters are outside their valid range
JSON_ERROR_INVALID_PARAMETER	Invalid parameter
JSON_ERROR_INVALID_TIME_FORMAT	Invalid (not supported) timestamp format for a specified JSON message parameter
JSON_ERROR_UNEXPECTED_STORAGE_TYPE	Unexpected (not supported) "storage" "type" specified by a JSON message parameter
JSON_ERROR_UNEXPECTED_STORAGE_VENDOR	Unexpected (not supported) "storage" "vendor" specified by a JSON message parameter
JSON_ERROR_UNEXPECTED_FUNCTION	Unexpected "function" specified by a JSON message parameter
JSON_ERROR_UNEXPECTED_COMPRESSION_TYPE	Unexpected (not supported) "compress" "type" specified by a JSON message parameter
JSON_ERROR_WRONG_JSON_FORMAT	JSON message is not in JSON format
OTHER_ERROR_UNKNOWN_STORAGE	Inserted storage is not a supported German fiscal element (TSE)
OTHER_ERROR_NO_STORAGE_FOUND	No valid storage is inserted
OTHER_ERROR_UPDATE_SYSTIME_FAIL	Failed to update the printer time
OTHER_ERROR_INVALID_ADMIN_USER_ID	A user ID with Admin privileges besides "Administrator" was specified
OTHER_ERROR_HOST_AUTHENTICATION_FAILED	Failed to authenticate the host (Incorrect hash value entered for AuthenticateUserForAdmin, AuthenticateUserForTimeAdmin, or AuthenticateHost)
OTHER_ERROR_UNAUTHENTICATED_TIME_ADMIN_USER	A request was received from an unauthenticated (not logged-in) user with TimeAdmin privileges
OTHER_ERROR_UNAUTHENTICATED_ADMIN_USER	A request was received from an unauthenticated (not logged-in) user with Admin privileges
OTHER_ERROR_UNAUTHENTICATED_USER	A request was received from a user not authenticated with Admin or TimeAdmin privileges
OTHER_ERROR_UNAUTHENTICATED_HOST	A request was received from an unauthenticated (not logged-in) host

Error Code	Condition
OTHER_ERROR_CURRENTLY_EXPORTING	Another request was received while in export status
OTHER_ERROR_NO_EXPORT_STARTED	A request was received that can only be executed in export status while not in export status (export not started)
OTHER_ERROR_CURRENTLY_EXPORTING_USER	The user ID who is currently exporting has logged out
OTHER_ERROR_NO_TIME_SET_BEFORE_EXPORT	German fiscal element (TSE) time was not updated before starting the export
OTHER_ERROR_ALREADY_ALL_DATA_EXPORTED	An export data acquisition request was received when all export data had been acquired
OTHER_ERROR_ALL_DATA_NOT_EXPORTED_YET	An export end request was received when all export data had not been acquired
OTHER_ERROR_TSE_ALREADY_SET_UP	Another set-up request was received for a German fiscal element (TSE) that is already set-up
OTHER_ERROR_SECRETKEY_REGISTRATION_FAILED	Failed to register the secret key
OTHER_ERROR_PARAMETER_MISMATCH	Incorrect parameters entered to specify the export range
OTHER_ERROR_TOO_MANY_TIME_ADMIN_ USER_LOGGED_IN	The number of users (clients) logged in with TimeAdmin privileges exceeds the upper limit
OTHER_ERROR_TOO_MANY_CHALLENGE_REQUESTED	The number of users requesting the challenge exceeds the upper limit
OTHER_ERROR_NO_MEMORY	Memory overflow error. This does not normally occur.
OTHER_ERROR_FATAL	Fatal error due to an unexpected event (mainly at the German fiscal element (TSE) side). This does not normally occur.

From German fiscal element (TSE)

Error Code	Condition
TSE1_ERROR_INVALID_PARAMETER	Invalid input parameter.
TSE1_ERROR_NO_TSE	No German fiscal element (TSE) was found at the provided path.
TSE1_ERROR_IO	No German fiscal element (TSE) detected (inserted) when a command request arrived * When the printer accesses German fiscal element (TSE)
TSE1_ERROR_TIMEOUT	The operation timed out
TSE1_ERROR_OUTOFMEM	A location was accessed that is outside the memory
TSE1_ERROR_INVALID_RESPONSE	No correct response from German fiscal element (TSE)
TSE1_ERROR_STORE_FULL_INTERNAL	German fiscal element (TSE) is internally full.
TSE1_ERROR_RESPONSE_MISSING	This happens if two commands are sent at the same time or if a command is not allowed in the current state.
TSE1_ERROR_EXPORT_NOT_INITIALIZED	German fiscal element (TSE) Store not initialized.
TSE1_ERROR_EXPORT_FAILED	Export Failed.
TSE1_ERROR_POWER_CYCLE_DETECTED	A power cycle occurred during command execution.
TSE1_ERROR_FIRMWARE_UPDATE_NOT_APPLIED	The firmware update was not properly applied.
TSE1_ERROR_FROM_TSE_FIRST	Lowest error code that might be raised from the German fiscal element (TSE).
TSE1_ERROR_UNKNOWN	Unspecified, internal processing error.
TSE1_ERROR_NO_TIME_SET	Time not set.
TSE1_ERROR_NO_TRANSACTION_IN_PROGRESS	No transaction in progress.
TSE1_ERROR_INVALID_CMD_SYNTAX	Wrong command length.
TSE1_ERROR_NOT_ENOUGH_DATA_WRITTEN	Not enough data written during transaction.
TSE1_ERROR_TSE_INVALID_PARAMETER	Invalid Parameter.
TSE1_ERROR_TRANSACTION_NOT_STARTED	Given transaction is not started.
TSE1_ERROR_MAX_PARALLEL_TRANSACTIONS	Maximum parallel transactions reached.
TSE1_ERROR_CERTIFICATE_EXPIRED	Certificate expired.
TSE1_ERROR_NO_LAST_TRANSACTION	No last transaction to fetch.
TSE1_ERROR_CMD_NOT_ALLOWED	Command not allowed in current state.
TSE1_ERROR_TRANSACTION_SIGNATURES_EXCEEDED	Signatures exceeded.
TSE1_ERROR_NOT_AUTHORIZED	Not authorized.
TSE1_ERROR_MAX_REGISTERED_CLIENTS_REACHED	Maximum registered clients reached.
TSE1_ERROR_CLIENT_NOT_REGISTERED	Client not registered.
TSE1_ERROR_EXPORT_UNACKNOWLEDGED_DATA	Failed to delete, data not completely exported.

Error Code	Condition
TSE1_ERROR_CLIENT_HAS_UNFINISHED_TRANSACTIONS	Failed to deregister, client has unfinished transactions.
TSE1_ERROR_TSE_HAS_UNFINISHED_TRANSACTIONS	Failed to decommission, German fiscal element (TSE) has unfinished transactions.
TSE1_ERROR_TSE_NO_RESPONSE_TO_FETCH	Wrong state, there is no response to fetch.
TSE1_ERROR_NOT_ALLOWED_EXPORT_IN_PROGRESS	Wrong state, ongoing Filtered Export must be finished before this command is allowed.
TSE1_ERROR_STORE_FULL	Operation failed, not enough remaining capacity in German fiscal element (TSE) Store.
TSE1_ERROR_WRONG_STATE_NEEDS_PUK_CHANGE	Wrong state, changed PUK required.
TSE1_ERROR_WRONG_STATE_NEEDS_PIN_CHANGE	Wrong state, changed PIN required.
TSE1_ERROR_WRONG_STATE_NEEDS_TSE_UNLOCK	Wrong state, unlocked German fiscal element (TSE) required.
TSE1_ERROR_WRONG_STATE_NEEDS_SELF_TEST	Wrong state, self test must be run first.
TSE1_ERROR_WRONG_STATE_NEEDS_SELF_TEST_PASSED	Wrong state, passed self test required.
TSE1_ERROR_FWU_INTEGRITY_FAILURE	Firmware Update: Integrity check failed.
TSE1_ERROR_FWU_DECRYPTION_FAILURE	Firmware Update: Decryption failed.
TSE1_ERROR_FWU_WRONG_FORMAT	Firmware Update: Wrong format.
TSE1_ERROR_FWU_INTERNAL_ERROR	Firmware Update: Internal error.
TSE1_ERROR_FWU_DOWNGRADE_PROHIBITED	Firmware Update: downgrade prohibited.
TSE1_ERROR_TSE_ALREADY_INITIALIZED	German fiscal element (TSE) already initialized.
TSE1_ERROR_TSE_DECOMMISSIONED	German fiscal element (TSE) decommissioned.
TSE1_ERROR_TSE_NOT_INITIALIZED	German fiscal element (TSE) not initialized.
TSE1_ERROR_AUTHENTICATION_FAILED	Authentication B90:C90failed.
TSE1_ERROR_AUTHENTICATION_PIN_BLOCKED	PIN is blocked.
TSE1_ERROR_AUTHENTICATION_USER_NOT_LOGGED_IN	Given user is not authenticated.
TSE1_ERROR_SELF_TEST_FAILED_FW	Self test of FW failed.
TSE1_ERROR_SELF_TEST_FAILED_CSP	Self test of CSP failed.
TSE1_ERROR_SELF_TEST_FAILED_RNG	Self test of RNG failed.
TSE1_ERROR_FWU_BASE_FW_ERROR	Firmware Update: Base FW update error.
TSE1_ERROR_FWU_FWEXT_ERROR	Firmware Update: FW Extension update error.
TSE1_ERROR_FWU_CSP_ERROR	Firmware Update: CSP update error.
TSE1_ERROR_EXPORT_NONE_IN_PROGRESS	Filtered Export: no export in progress.
TSE1_ERROR_EXPORT_RETRY	Filtered Export: no new data, keep polling.
TSE1_ERROR_EXPORT_NO_DATA_AVAILABLE	Filtered Export: no matching entries, export would be empty.
TSE1_ERROR_CMD_NOT_FOUND	Command not found
TSE1_ERROR_SIG_ERROR	Signature creation error.

Error Code	Condition
TSE1_ERROR_FROM_TSE_LAST	Highest error code that might be raised from the German fiscal element (TSE).
TSE1_ERROR_RAISED_FROM_TSE	Errors that raised from the German fiscal element (TSE) except for the above. In the current version, it might be raised when the German fiscal element (TSE) self test fails.