IDEMIA

Security Target Lite

IDeal Citiz 2.17-i embedding ID.me 1.6-i application

Reference: 2018_2000037323

Issue Date: 2018-09-05

DOCUMENT EVOLUTION

Version	Date	Author	Revision
1.0	05/09/2018	IDEMIA	Initial version

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1 TOE Overview

This document is the Security Target Lite for the ID.me 1.6-i Applet on IDeal Citiz 2.17-i Platform which is a IDEMIA specific Java Card implementation of the Identification Authentication Signature for European Citizen Card v1.0.1 [IAS ECC].

ID.me is designed to be compliant with the IAS ECC v1.0.1 specification [IAS ECC], taking into account the addendum [IAS ADD].

The TOE addressed by the current ST is a SSCD device (combination of SSCD Parts 1 to 6) according to [DIR] that may:

1) SSCD Part 2: that performs the generation of signature keys in the device [PP-SSCD2],
2) SSCD Part 3: that performs the import of the signature keys generated in a trusted manner outside the device [PP-SSCD3],
3) SSCD Part 4: that specifies an extension for an SSCD with key generation (SSCD Part 2) that support establishing a trusted channel with a certificate generation application (CGA) [PP-SSCD4],
4) SSCD Part 5: that specifies an extension for an SSCD with key generation (SSCD Part 2) that additionally supports establishing a trusted channel with a signature creation application (SCA)) [PP-SSCD5] and
5) SSCD Part 6: that specifies an extension for an SSCD with key import (SSCD Part 3) that additionally supports establishing a trusted channel with a signature creation application (SCA) [PP-SSCD6].
6) The TOE adds EAC V2 protocol. The additional functions of the protocol are based on the PP EACV2 defined in [EAC2-PP].

ID.me Application is a set of Java card services intended to be used exclusively on the IDeal Citiz 2.17-i Java card Platform, which is certified according to CC EAL 5+ [ST-PL]. This Platform is based on the Infineon M7892 B11 IC security controller, which is itself certified according to CC EAL 6+ [ST-IC], [CR-IC].

This ST has been conceived to prepare a Common Criteria evaluation following the "compositional approach" described in [COMP]. This approach consists in starting from a Platform that has been independently certified, and performing an evaluation of the product resulting from embedding an Application into it, which makes use of some of the results issued from the evaluation of the IDeal Citiz 2.17-i Java card Platform.

This document provides a list of security requirements for the ID.me Applet embedded in a Java Card platform.

This Security Target describes:

- The Target of Evaluation (TOE)
- The assets to be protected, the threats (T) to be countered by the TOE itself during the usage of the TOE,
- The organizational security policies (OSP), and the assumptions (A),
- The security objectives (OT) for the TOE and its environment (OE),
- The security functional requirements (SFR) for the TOE and its IT environment,
- The TOE security assurance requirements (SAR),
- The TOE Summary specification (TSS).

1.1 ST Identification

Title	Security Target Lite IDeal Citiz 2.17-i embedding ID.me 1.6-i application
Reference	2018_2000037323
Version	1.0
ITSEF	CEA-LETI
Certification Body	ANSSI
Author	IDEMIA
CC Version	3.1 Revision 5
Assurance Level	EAL5 augmented with ALC_DVS.2 and AVA_VAN.5
Protection Profiles	PP SSCD-Part 2 Key Generation [PP-SSCD2], PP SSCD-Part 3 Key Import [PP-SSCD3], PP SSCD-Part 4 Key Generation and Trusted Channel with CGA [PP-SSCD4] PP SSCD-Part 5 Key Generation and Trusted Channel with SCA [PP-SSCD5] PP SSCD-Part 6 Key Import and Trusted Channel with SCA [PP-SSCD6]

1.2 TOE Reference

TOE name	IDeal Citiz 2.17-i embedding ID.me 1.6-i application
TOE version number	1.6-i
Name of Platform	IDeal Citiz v2.17-i on Infineon M7892 B11 - Java Card Open Platform certified by the French ANSSI certification body (ANSSI-CC-2018/27) on 02-07-2018
IC reference	Infineon M7892 B11 with optional RSA2048/4096 v1.02.013 or v2.07.003, EC v1.02.013 or v2.07.003, SHA-2 v1.01, SCL v2.02.012, Base v1.02.013 or v2.07.003, and Toolbox v1.02.013 or v2.07.003 libraries and with specific IC dedicated software (firmware) (Certification ID: BSI-DSZ-CC-0782-V4-2018)

1.3 TOE documentation

TOE documentation is described in the table below:

Reference	Description
[AGD_PRE]	2018_2000034155 - ID.me 1.6-i application Preparative Procedures, v1.5. IDEMIA. 2018_2000034156 - ID.me 1.6-i application Personalization Specification, v1.5. IDEMIA.
[AGD_OPE]	2018_2000034153 - ID.me 1.6-i application Operational Guidance, v1.3. IDEMIA. 2018_2000034154 - ID.me 1.6-i application User Manual, v1.4. IDEMIA.

2 Technical terms, Abbreviation and Associated references

2.1 Technical terms

Term	Definition
Application note	*Optional informative part of the ST containing sensitive supporting information that is considered relevant or useful for the construction, evaluation or use of the TOE.*
Administrator	*user who performs TOE initialization, TOE personalization, or other TOE administrative functions*
Advanced electronic signature	*An electronic signature which meets the following requirements [DIR]:* *(i) it is uniquely linked to the signatory,* *(ii) it is capable of identifying the signatory,* *(iii) it is created using means that the signatory can maintain under his sole control,* *(iv) it is linked to the data to which it relates in such a manner that any subsequent change of the data is detectable.*
Authentication data	*information used to verify the claimed identity of a user*
Authentication	*Authentication defines a procedure that verifies the identity of the communication partner. The most elegant method is based on the use of so called digital signatures.*

Card Access Number (CAN)	*A short password that is printed or displayed on the document. The CAN is a non-blocking password. The CAN may be static (printed on the Identification Card), semi-static (e.g. printed on a label on the Identification Card) or dynamic (randomly chosen by the Card and displayed by it using e.g. ePaper, OLED or similar technologies), see [D03110], sec. 3.3*
Certificate	*digital signature used as electronic attestation binding signature-verification data to a person confirming the identity of that person as legitimate signer*
Certificate info	*information associated with an SCD/SVD pair that may be stored in a secure signature creation device* *NOTE 1: Certificate info is either* - *a signer's public key certificate or,* - *one or more hash values of a signer's public key certificate together with an identifier of the hash function used to compute the hash values.* *NOTE 2: Certificate info may contain information to allow the user to distinguish between several certificates.*
Certificate-generation application (CGA)	*collection of application components that receive the SVD from the SSCD to generate a certificate obtaining data to be included in the certificate and to create a digital signature of the certificate*
Certificate revocation list	*A list of revoked certificates issued by a certificate authority*
Certification service provider (CSP)	*entity that issues certificates or provides other services related to electronic signatures*
Data to be signed (DTBS)	*all of the electronic data to be signed including a user message and signature attributes*
Data to be signed or its unique representation (DTBS/R)	*data received by a secure signature creation device as input in a single signature creation operation* *NOTE: Examples of DTBS/R are* - *a hash value of the data to be signed (DTBS), or* - *an intermediate hash value of a first part of the DTBS complemented with a remaining part of the DTBS, or* - *the DTBS.*
ECC	*(Elliptic Curve Cryptography) class of procedures providing an attractive alternative for the probably most popular asymmetric procedure, the RSA algorithm.*
Hash function	*A function which forms the fixed-size result (the hash value) from an arbitrary amount of data (which is the input). These functions are used to generate the electronic equivalent of a fingerprint. The significant factor is that it must be impossible to generate two entries which lead to the same hash value (so called collisions) or even to generate a matching message for a defined hash value.*

Integrity	*The test on the integrity of data is carried out by checking messages for changes during the transmission by the receiver. Common test procedures employ Hash functions, MACs (Message Authentication Codes) or – with additional functionality – digital signatures.*
Javacard	*A smart card with a Javacard operation system.*
Legitimate user	*An user of a secure signature creation device who gains possession of it from an SSCD provisioning service provider and who may be authenticated by the SSCD as its signatory.*
MAC	*Message Authentication Code. Algorithm that expands the message by means of a secret key by special redundant pieces of information, which are stored or transmitted together with the message. To prevent an attacker from targeted modification of the attached redundancy requires its protection in a suitable way.*
Notified body	*An organizational entity designated by a member state of the European Union as responsible for accreditation and supervision of the evaluation process for products conforming to [PP-SSCD2], [PP-SSCD5] and for determining admissible algorithms and algorithm parameters.*
Non repudiation	*One of the objectives in the employment of digital signatures. It describes the fact that the sender of a message is prevented from denying the preparation of the message. The problem cannot be simply solved with cryptographic routines, but the entire environment needs to be considered and respective framework conditions need to be provided by pertinent laws.*
PACE Terminal (PCT)	*A technical system verifying correspondence between the stored password and the related value presented to the terminal. PCT implements the terminal's part of the PACE protocol and authenticates itself to the Card using a shared password (CAN, PIN or PUK). The PCT is not allowed reading User Data (see sec. 4.2.2 in [D03110]).* *See [D03110], chap. 3.3, 4.2, table 1.2 and G.2.*
Password Authenticated Connection Establishment (PACE)	*A communication establishment protocol defined in [D03110], sec. 4.2. The PACE Protocol is a password authenticated DiffieHellman key agreement protocol providing implicit password based authentication of the communication partners (e.g. smart card and the terminal connected): i.e. PACE provides a verification, whether the communication partners share the same value of a password π). Based on this authentication, PACE also provides a secure communication, whereby confidentiality and authenticity of data transferred within this communication channel are maintained.*
Private key	*Secret key only known to the receiver of a message, which is used in asymmetric ciphers for encryption or generation of digital signatures.*
Pseudo random number	*Many cryptographic mechanisms require random numbers (e.g. in key generation). The problem, however, is that it is difficult to implement true random numbers in software. Therefore, so called pseudo random number generators are used, which then should be initialized with a real random element (the so called seed).*
Public Key	*Publicly known key in an asymmetric cipher which is used for encryption and verification of digital signatures.*
Public key infrastructure (PKI)	*Combination of hardware and software components, policies, and different procedures used to manage digital certificates.*

Qualified certificate	*public key certificate that meets the requirements laid down in Annex I and that is provided by a CSP that fulfils the requirements laid down in Annex II (the directive: 2.10) [DIR]*
Qualified electronic signature	*advanced electronic signature that has been created with an SSCD with a key certified with a qualified certificate ([DIR]: 5.1).*
Random numbers	*Many cryptographic algorithms or protocols require a random element, mostly in form of a random number, which is newly generated in each case. In these cases, the security of the procedure depends in part on the suitability of these random numbers. As the generation of real random numbers within computers still imposes a problem (a source for real random events can in fact only be gained by exact observation of physical events, which is not easy to realize for software), so called pseudo random numbers are used instead.*
Reference authentication data (RAD)	*Data persistently stored by the TOE for authentication of a user as authorised for a particular role.*
Secure messaging	*Secure messaging using encryption and message authentication code ac-cording to ISO/IEC 7816-4.*
Secure signature creation device (SSCD)	*Personalized device that meets the requirements laid down in [DIR], Annex III by being evaluated according to a security target conforming to this PP ([DIR]: 2.5 and 2.6).*
Signatory	*legitimate user of an SSCD associated with it in the certificate of the signature-verification data and who is authorized by the SSCD to operate the signature-creation function*
Signature attributes	*Additional information that is signed together with a user message.*
Signature creation application (SCA)	*Application complementing an SSCD with a user interface with the purpose to create an electronic signature. Note: A signature creation application is software consisting of a collection of application components configured to:* ▪ *present the data to be signed (DTBS) for review by the signatory,* ▪ *obtain prior to the signature process a decision by the signatory,* ▪ *if the signatory indicates by specific unambiguous input or action its in-tent to sign send a DTBS/R to the TOE,* ▪ *process the electronic signature generated by the SSCD as appropriate, e.g. as attachment to the DTBS.*
Signature creation data (SCD)	*private cryptographic key stored in the SSCD under exclusive control by the signatory to create an electronic signature*
Signature creation system (SCS)	*complete system that creates an electronic signature consisting of an SCA and an SSCD*
Signature verification data (SVD)	*public cryptographic key that can be used to verify an electronic signature*

Signed data object	*The electronic data to which the electronic signature has been attached to or logically associated with as a method of authentication.*
Smart card	*A smart card is a chip card which contains an internal micro controller with CPU, volatile (RAM) and non-volatile (FLASH) memory, i.e. which can carry out its own calculations in contrast to a simple storage card. Sometimes a smart card has a numerical coprocessor (NPU) to execute public key algorithms efficiently. Smart cards have all of their functionality comprised on a single chip (in contrast to chip cards, which contain several chips wired to each other). There-fore, such a smart card is ideal for use in cryptography as it is almost impossible to manipulate its internal processes.*
SSCD provisioning service	*service to prepare and provide an SSCD to a subscriber and to support the signatory with certification of generated keys and administrative functions of the SSCD*
User	*entity (human user or external IT entity) outside the TOE that interacts with the TOE*
User Message	*data determined by the signatory as the correct input for signing*
Verification authentication data (VAD)	*data provided as input to a secure signature creation device for authentication by cognition or by data derived from a user's biometric characteristics*

2.2 Abbreviation

Acronym	Definition
CA	*Certification authority*
CAD	*card acceptance device*
CAN	*Card Access Number*
CC	*Common Criteria*
CGA	*Certification generation application*
CPU	*Central Processing Unit*
CSP	*certification service provider*
DPA	*differential power analysis*
DTBS	*Data to be signed*
DTBS/R	*Data to be signed or its unique representation*
EAL	*Evaluation assurance level*
ECC	*Elliptic Curve Cryptography*
FLASH	*electrically erasable and programmable read only memory*
GP	*GlobalPlatform*
HID	*human interface device*
IT	*Information technology*
MAC	*Message Authentication Code*
OS	*Operating System*

OSP	*Organizational security policy*
PACE	*Password Authenticated Connection Establishment*
PIN	*Personal Identification Number*
PP	*Protection profile*
PUK	*PIN Unblocked Key*
RAD	*Reference authentication data*
RAM	*random access memory*
RF	*Radio Frequency*
RNG	*random number generation*
SAR	*Security Assurance Requirements*
SCA	*Signature creation application*
SCD	*Signature creation data*
SCS	*Signature creation system*
SDO	*Security data object*
SF	*security function*
SFP	*Security function policy*
SFR	*Security functional requirement*
SPA	*simple power analysis*
SSCD	*Secure signature creation device*
ST	*Security target*
SVD	*Signature verification data*
TOE	*Target of evaluation*
TSF	*TOE security functionality*
VAD	*Verification authentication data*

2.3 Associated references

[CC1]	Common Criteria for Information Technology Security Evaluation, Part 1: Introduction and general model. Version 3.1. Revision 5. April 2017. CCMB-2017-04-001.
[CC2]	Common Criteria for Information Technology Security Evaluation, Part 2: Security functional requirements. Version 3.1. Revision 5. April 2017. CCMB-2017-04-002.
[CC3]	Common Criteria for Information Technology Security Evaluation, Part 3: Security assurance requirements. Version 3.1. Revision 5. April 2017. CCMB-2017-04-003.
[CEM]	Common Methodology for Information Technology Security Evaluation, Evaluation Methodology. Version 3.1. Revision 5. April 2017. CCMB-2017-04-004.
[COMP]	Composite product evaluation for smart cards and similar devices, Version 1.5, October 2017.
[PP-PACE]	Protection Profile Machine Readable Travel Document using Standard Inspection Procedure with PACE – Common Criteria Protection Profile, BSI-CC-PP-0068-V2-2011, Version 1.0, 2nd November 2011.
[PP-IC]	Security IC platform protection profile, version 1.0, 15th June 2007. Registered and Certified by Bundesamt für Sicherheit in der Informationstechnik (BSI) under the reference BSI-PP-0035.
[PP-SSCD2]	Protection profiles for secure signature creation device — Part 2: Device with key Generation BSI-CC-PP-0059-2009-MA-01, Version 2.0.1, February 2012.
[PP-SSCD3]	Protection profiles for secure signature creation device – Part3: Device with key import BSI-CC-PP-0075-2012, Version 1.0.2, September 2012
[PP-SSCD4]	Protection profiles for secure signature creation device — Part 4: Extension for device with key generation and trusted communication with certificate generation application BSI-CC-PP-0071-2012, Version 1.0.1, December 2012.
[PP-SSCD5]	Protection profiles for secure signature creation device — Part 5: Extension for device with key generation and trusted communication with signature creation application BSI-CC-PP-0072-2012, Version 1.0.1, December 2012.
[PP-SSCD6]	Protection profiles for secure signature creation device – Part6: Extension for device with key import and trusted communication with signature-creation application BSI-CC-PP-0076-2013, Version 1.0.4, April 2013
[PP-PL]	JavaCard Protection Profile – Open Configuration, Version 3.0, May, 2012. Certified by ANSSI under the reference ANSSI-CC-PP-2010/03-M01

[ST-PL]	2018_2000035222 - Security Target Lite IDeal Citiz v2.17-i on Infineon M7892 B11-Java Card Open Platform-. v1.0. IDEMIA
[ST-IC]	Security Target Lite M7892 B11, Recertification, Common Criteria CC v3.1 EAL6 augmented (EAL6+), version 3.0, 2017-11-10, Infineon.
[CR-IC]	BSI Certification Report BSI-DSZ-CC-0782-V4-2018 for Infineon Security Controller M7892 B11, 09-01-2018
[ICAO-9303]	International Civil Aviation Organization, ICAO Doc 9303, Machine Readable Travel Documents – 7th edition, 2015
[D03110]	Technical Guideline TR-03110-1, Advanced Security Mechanisms for Machine Readable Travel Documents –Part 1 – eMRTDs with BAC/PACEv2 and EACv1, Version 2.10, 20.03.2012 by BSI
[D14890-2]	Application Interface for smart cards used as Secure Signature Creation Devices - Part 2: Additional Services.
[AIS31]	Functionality classes and evaluation methodology for physical random number generators AIS31, Version 3.0, 2013-05-15, Bundesamt für Sicherheit in der Informationstechnik and belonging "A proposal for: Functionality classes for random number generators", Version 2.0, 2011- 09-18, Wolfgang Killmann, T-Systems GEI GmbH, Werner Schindler, Bundesamt für Sicherheit in der Informationstechnik.
[IAS ECC]	Identification Authentication Signature - European Citizen Card Technical Specifications Revision: 1.0.1.
[IAS ADD]	0000098587-01 Addendum IAS-ECC v1.0.1UK.
[DIR]	DIRECTIVE 1999/93/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 December 1999 on a Community framework for electronic signatures.
[Note10]	CERTIFICATION OF APPLICATIONS ON "OPEN AND ISOLATING PLATFORM Paris, the 27th July 2012. Reference: ANSSI-CCNOTE/10EN.02deW10
[JCRE]	JavaCard Platform, version 3.0.1 (, Classic Edition, including Specification Errata, October 2010, Updated February 2011. Runtime Environment (JavaCard RE) Specification. March 2008. Published by Sun Microsystems, Inc.
[JCAPI]	JavaCard Platform, versions 3.0 (March 2008) and 3.0.1, Classic Edition, including Specification Errata, October 2010, Updated February 2011, Application Programming Interface, March 2008. Published by Sun Microsystems, Inc.
[GP]	GlobalPlatform, Card Specification, Version 2.1.1, March 2003.
[EAC2-PP]	Common Criteria Protection Profile Profile Electronic Document implementing Extended Access Control Version 2 defined in BSI TR-03110, BSI-CC-PP-0086, Version 1.01, May 20th, 2015, BSI
[TR-03110-2]	BSI: TR-03110-2: Advanced Security Mechanisms for Machine Readable Travel Documents. Part 2 - Extended Access Control Version 2 (EACv2), Password Authenticated Connection Establishment (PACE), and Restricted Identification (RI), Version 2.10, 20. March 2012 by BSI
[TR03110-3]	BSI: TR-03110-3: Advanced Security Mechanisms for Machine Readable Travel Documents. Part 3 - Common Specifications, Version 2.10, 07. March 2012 by BSI

3 TOE Description

3.1 Product Presentation

The product IDeal Citiz 2.17-i embedding ID.me 1.6-i application is an integrated circuit chip embedding

- An Operating system providing:
  - Java Card interfaces, as specified in [JCAPI]
  - Extended interfaces for targeted applications needs
  - A card manager application compliant with the GlobalPlatform v2.1.1 specifications [GP] standard. This application enables the card issuer to add functionality to the product by loading and executing new applets, even in the evaluated configuration.
- An ID.me application compliant with the IAS ECC v1.0.1 specification [IAS ECC].

All applications are protected against post issuance Java Card applet loading and execution thanks to a firewall mechanism.

3.2 TOE Type

The ID.me is an European Card for e-Services and national e-ID Applications based on Java Card. ID.me is designed to be compliant with the IAS ECC v1.0.1 specification [IAS ECC], taking into account the addendum [IAS ADD]. It provides the following services:

1) SSCD containing data needed for generating electronic signatures on behalf of the Card Holder as well as for user authentication; this application is intended to be used in the context of official and commercial services, where an electronic signature of the Card Holder is required: to be certified according to [PP-SSCD2], [PP-SSCD3], [PP-SSCD4], [PP-SSCD5] and [PP-SSCD6].
2) PACE authentication to ensure a trusted channel secure communication with a SCA and a CGA.
3) Extended Access Control Version 2 (EAC2) as defined in [TR-03110-2]. It consists of two parts: Chip Authentication Protocol Version 2 and Terminal Authentication Protocol Version 2.

The TOE comprises of

- The Infineon M7892 B11 integrated circuit [ST-IC] with optional RSA2048/4096 v1.02.013 or v2.07.003, EC v1.02.013 or v2.07.003, SHA-2 v1.01, SCL v2.02.012, Base v1.02.013 or v2.07.003, and Toolbox v1.02.013 or v2.07.003 libraries and with specific IC dedicated software (firmware),
- The IDeal Citiz v2.17-i Java Card Open Platform,
- The applet containing SSCD and PKI functionalities (Optional) and,
- The associated guidance documentation [AGD_OPE], [AGD_PRE].

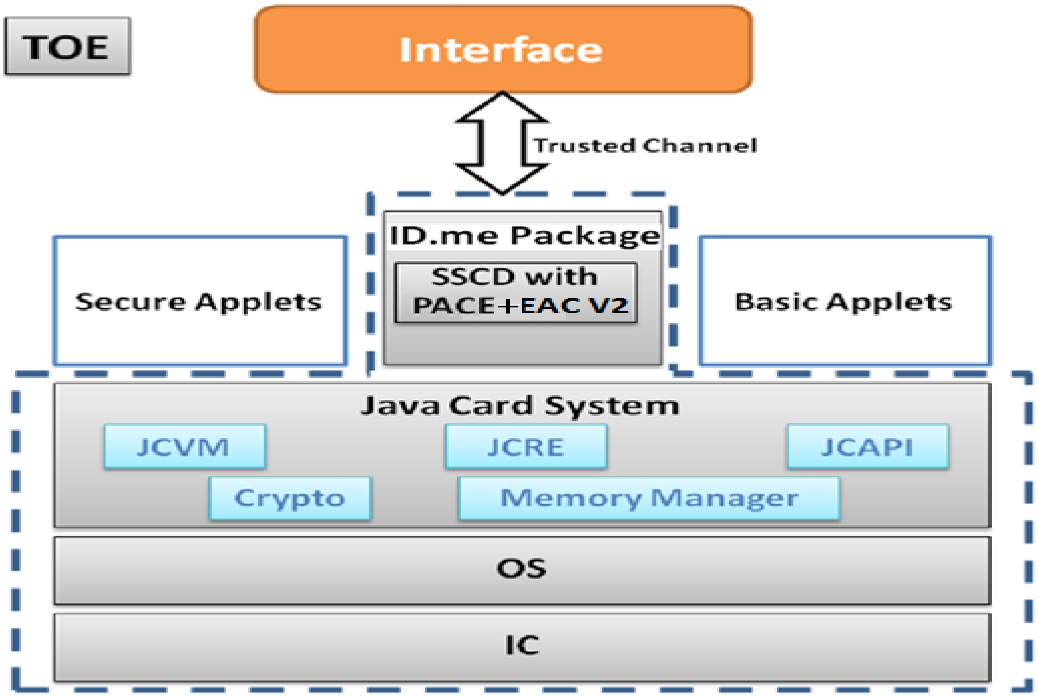


Figure 1: TOE physical scope

The ID.me Applet has been splitted into 3 modules. This permits to have ID.me with and without PKI service, and being able to better manage available memory. The Applet contains the following three configurations:

1. ID.me without PKI service
2. ID.me with PKI (IAS ECC) service
3. ID.me with PKI (EAC2) service

The PKI modules (IAS ECC and EAC2) implement mainly the following two additional functionalities:

- Asymmetric Role Auth mechanism on RSA as defined in IAS-ECC [IAS ECC] specifications:
    - READ BINARY,
    - MSE SET,
    - GET DATA K.ICC,
    - PSO VERIFY CERTIFICATE,
    - GET CHALLENGE,
    - EXTERNAL AUTHENTICATE.
- Addional combination of the use of Role Authentication and Device Authentication following a specific requirement from the customer in order to give rights to different roles with a performant protocol.

The scope of this TOE encompasses the three configurations mentioned above. The ID.me applet is configured during the pre-personalization phase.

These three configurations are flashed into the card and at pre-perso phase, the PKI modules are removed if not required by the customer. The PKI functionality is optionally loaded and activated within the pre-personalization phase. Hence, the applet can be configured as follows:

1) ID.me without PKI service or

2) ID.me with PKI (IAS ECC) service or

3) ID.me with PKI (EAC2) service.

Since the TOE claims compliancy to 419 211-2 till EN 419 211-6 (Signature Protection Profiles [PP-SSCD2], [PP-SSCD3], [PP-SSCD4], [PP-SSCD5] and [PP-SSCD6]), the TOE can be used as (depending on its configuration during personalization):

- Config#1 claiming compliancy to CEN/EN 419 211-2/3/4/5/6 ([PP-SSCD2], [PP-SSCD3], [PP-SSCD4], [PP-SSCD5] and [PP-SSCD6]).
- Config#2 claiming compliancy to CEN/EN 419 211-2/3/4 ([PP-SSCD2], [PP-SSCD3], [PP-SSCD4]). This configuration does not support the trusted channel between the TOE and the SCA.
- Config#3 claiming compliancy to CEN/EN 419 211-2/3 ([PP-SSCD2], [PP-SSCD3]). This configuration does not support the trusted channel between: (i) the TOE and the SCA; (ii) the TOE and the CGA.

Beside the TOE, the product can include other Java Card applications (out of scope of the TOE). IDeal Citiz v2.17-i Java Card Open Platform enforces separation of the data between the applets and associated packages imposing logical separation of data using the Java Card™ Firewall [JCRE].

3.3 TOE Functions

The TOE is a combination of hardware and software configured to securely create, import, use and manage signature creation data (SCD). The SSCD protects the SCD during its whole lifecycle as to be used in a signature creation process solely by its signatory.

The TOE comprises all IT security functionality necessary to ensure the secrecy of the SCD and the security of the electronic signature.

The TOE provides the following functions:

- generation of the SCD and the correspondent SVD,
- importation of the SCD and, optionally, the correspondent signature verification data (SVD)
- export the SVD for certification through a trusted channel to the CGA,
- prove the identity as SSCD to external entities
- optionally, receive and store certificate info,
- switch the TOE from a non operational state to an operational state, and

- if in an operational state, create digital signatures for data with the following steps:
    - select an SCD if multiple are present in the SSCD,
    - receive DTBS or a unique representation thereof DTBS/R through a trusted channel with SCA.
    - authenticate the signatory and determine its intent to sign,
    - apply an appropriate cryptographic signature creation function using the selected SCD to the DTBS/R
- identification and authentication of trusted users and applications,
- data storage and protection from modification or disclosures, as needed,
- secure exchange of sensitive data between the TOE and a trusted applications,
- secure exchange of sensitive data between the TOE and a trusted human interface device.

The TOE is prepared for the signatory's use by

- generating or importing at least one SCD/SVD pair, and
- personalizing for the signatory by storing in the TOE:
    - the signatory's reference authentication data (RAD)
    - optionally, certificate info for at least one SCD in the TOE.

After preparation or import the SCD shall be in a non-operational state. Upon receiving a TOE the signatory shall verify its non-operational state and change the SCD state to operational.

After preparation the intended, legitimate user should be informed of the signatory's verification authentication data (VAD) required for use of the TOE in signing. If the VAD is a password, PIN or a biometric template, providing this information shall protect the confidentiality of the corresponding RAD.

If the use of an SCD is no longer required, then it shall be destroyed (e.g. by erasing it from memory) as well as the associated certificate info, if any exists.

3.4 Operation of the TOE

This section presents a functional overview of the TOE in its distinct operational environments:

1) The preparation environment, where it interacts with a certification service provider through a SCD/SVD generation application to import, if applicable, a signature creation data (SCD) and a certificate generation application (CGA) to obtain a certificate for the signature validation data (SVD) corresponding with the SCD the TOE or the CSP has generated. In case of SCD/SVD generation by the CSP, the SCD/SVD generation application transmits the SVD to the CGA. The initialization environment interacts further with the TOE to personalize it with the initial value of the reference authentication data (RAD). Optionally, the TOE may export the SVD through a trusted channel allowing the CGA to check the authenticity of the SVD.
2) The signing environment where it interacts with a signer through a signature creation application (SCA) to sign data after authenticating the signer as its signatory. The signature creation application provides the data to be signed (DTBS), or a unique representation thereof (DTBS/R) as input to the TOE signature creation function and obtains the resulting digital signature. Optionally, the TOE and the SCA may communicate through a trusted channel to ensure the confidentiality and the integrity of the DTBS/R.

3) The management environments where it interacts with the user or an SSCD-provisioning service provider to perform management operations, e.g. for the signatory to reset a blocked RAD. A single device, e.g. a smart card terminal, may provide the required secure environment for management and signing.

As shown in Figure 2 through Figure 6, the signing environment, the management environment and the preparation environment are secure and protect data exchanged with the TOE. The protection of data exchanged with the TOE is realized by a trusted communication.

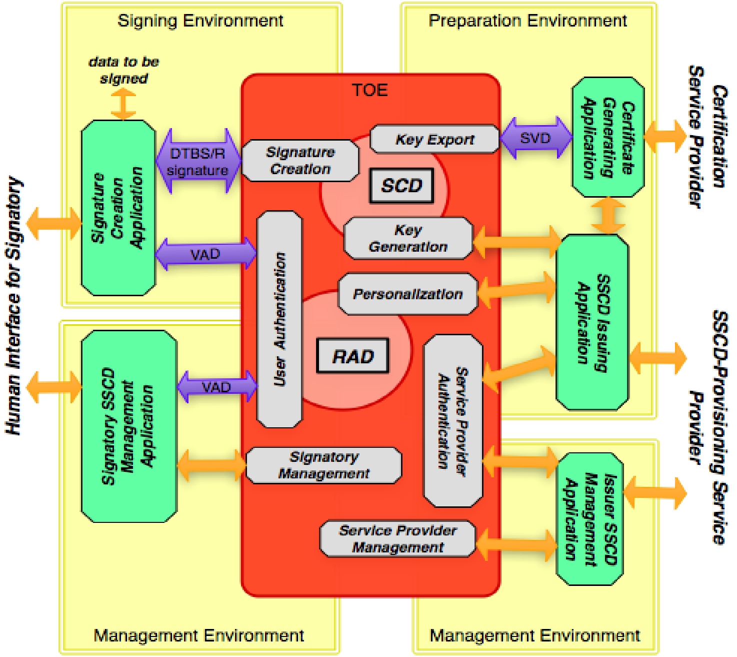

Signing Environment
Preparation Environment
data to be signed
TOE
Signature Creation Application
DTBS/R signature
Signature Creation
Key Export
SVD
Certificate Generating Application
Certification Service Provider
SCD
Key Generation
VAD
User Authentication
Personalization
SSCD Issuing Application
SSCD-Provisioning Service Provider
Human Interface for Signatory
RAD
Signatory SSCD Management Application
VAD
Service Provider Authentication
Signatory Management
Issuer SSCD Management Application
Service Provider Management
Management Environment
Management Environment

Figure 2: TOE and Operational environments with Key Generation

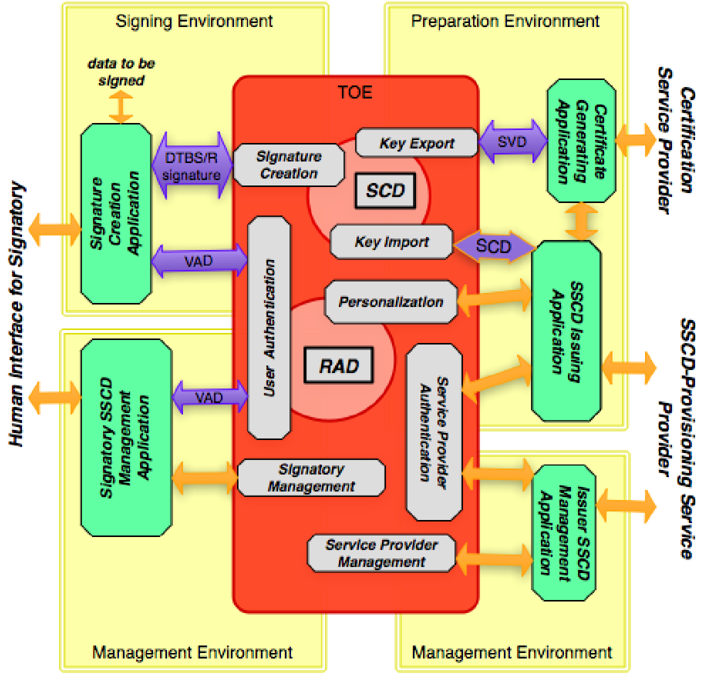

Signing Environment
Preparation Environment
data to be signed
TOE
Signature Creation Application
DTBS/R signature
Signature Creation
Key Export
SVD
Certificate Generating Application
Certification Service Provider
SCD
Key Import
SCD
VAD
User Authentication
Personalization
SSCD Issuing Application
RAD
Human Interface for Signatory
Signatory SSCD Management Application
VAD
Service Provider Authentication
SSCD-Provisioning Service Provider
Signatory Management
Issuer SSCD Management Application
Service Provider Management
Management Environment
Management Environment

Figure 3: TOE and Operational environments with Key Import

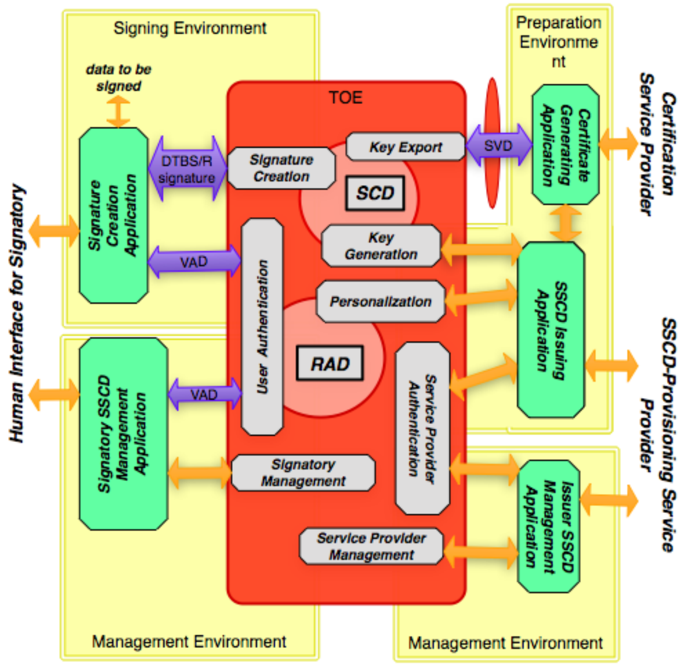

Signing Environment
Preparation Environme nt
data to be signed
TOE
Signature Creation Application
DTBS/R signature
Signature Creation
Key Export
SVD
Certificate Generating Application
Certification Service Provider
SCD
Key Generation
VAD
User Authentication
Personalization
SSCD Issuing Application
RAD
Human Interface for Signatory
Signatory SSCD Management Application
VAD
Service Provider Authentication
SSCD-Provisioning Service Provider
Signatory Management
Issuer SSCD Management Application
Service Provider Management
Management Environment
Management Environment

Figure 4: TOE and Operational environments with Key Generation and trusted channel to CGA

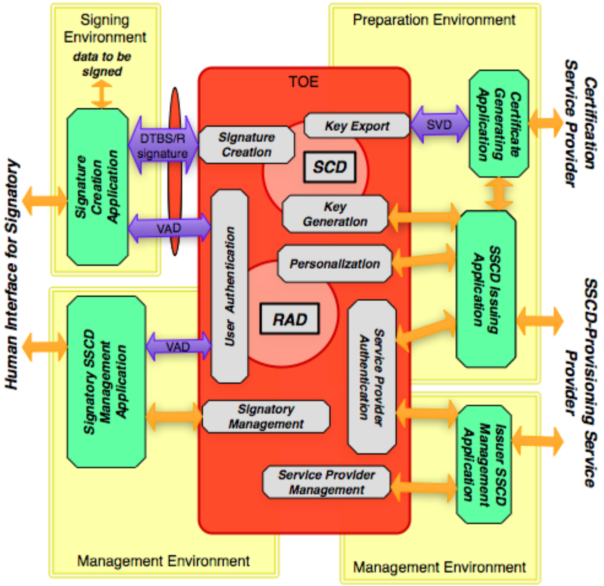

Signing Environment
data to be signed
Preparation Environment
TOE
Signature Creation Application
DTBS/R signature
VAD
Signature Creation
Key Export
SVD
SCD
Key Generation
Personalization
User Authentication
RAD
Service Provider Authentication
Signatory Management
Service Provider Management
Certificate Generating Application
SSCD Issuing Application
Issuer SSCD Management Application
Signatory SSCD Management Application
Human Interface for Signatory
Certification Service Provider
SSCD-Provisioning Service Provider
Management Environment
Management Environment

Figure 5: TOE and Operational environments with Key Generation and trusted channel to SCA

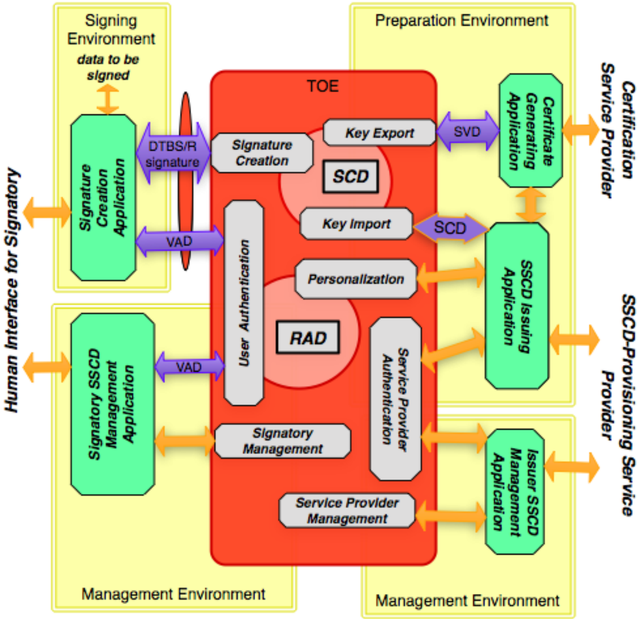

Signing Environment
data to be signed
Preparation Environment
TOE
Signature Creation Application
DTBS/R signature
VAD
Signature Creation
Key Export
SVD
SCD
Key Import
SCD
Personalization
User Authentication
RAD
Service Provider Authentication
Signatory Management
Service Provider Management
Certificate Generating Application
SSCD Issuing Application
Issuer SSCD Management Application
Signatory SSCD Management Application
Human Interface for Signatory
Certification Service Provider
SSCD-Provisioning Service Provider
Management Environment
Management Environment

Figure 6: TOE and Operational environments with Key Import and trusted channel to SCA

The TOE stores signature creation data and reference authentication data. The TOE may store multiple instances of SCD. In this case the TOE shall provide a function to identify each SCD and the SCA can provide an interface to the signer to select an SCD for use in the signature creation function of the SSCD. The TOE protects the confidentiality and integrity of the SCD and restricts its use in signature creation to its signatory. The digital signature created by the TOE is a qualified electronic signature as defined in Article 5.1 of the directive [DIR]. Determining the state of the certificate as qualified is beyond the scope of this standard.

The signature creation application shall protect the integrity of the input it provides to the TOE signature creation function as being consistent with the user data authorized for signing by the signatory. Unless implicitly known to the TOE, the SCA indicates the kind of the signing input (as DTBS/R) it provides and computes any hash values required. The TOE may augment the DTBS/R with signature parameters it stores and then computes a hash value over the input as needed by the kind of input and the used cryptographic algorithm. Optionally, the TOE and the SCA may communicate through a trusted channel in order to protect the integrity of the DTBS/R.

The TOE stores signatory RAD to authenticate a user as its signatory. The RAD is a password e.g. PIN, a biometric template or a combination of these. The TOE protects the confidentiality and integrity of the RAD. The TOE receives the VAD from the signature creation application. The signature creation application protects the confidentiality of this data.

A certification service provider and a SSCD-provisioning service provider interact with the TOE in the secure preparation environment to perform any preparation function of the TOE required before control of the TOE is given to the legitimate user. These functions include but are not limited to:

- initializing the RAD,
- generating a key pair,
- storing personal information of the legitimate user.

Optionally, the TOE and the CGA communicate through a trusted channel in order to protect the integrity and authenticity of the SVD exported from the TOE.

The TOE is a SSCD with PACE on a smart card. A smart card terminal shall be deployed that provides the required secure environment to handle a request for signatory authorization. A signature can be obtained on a document prepared by a signature creation application component running on personal computer connected to the card terminal. The signature creation application, after presenting the document to the user and after obtaining the authorization initiates the digital signature creation function of the smart card through the terminal.

This TOE does not implement, in addition to the functions of the SSCD, the signature creation application (SCA). The SCA presents the data to be signed (DTBS) to the signatory and prepares the DTBS representation the signatory wishes to sign for performing the cryptographic function of the signature. The SCA is considered as part of the environment of the TOE.

The TOE allows implementing a Human Interface (HI) for user authentication:

1) by the TOE itself or
2) by a trusted human interface device connected via a trusted channel with the TOE.

The human interface device is used for the input of VAD for authentication by knowledge or for the generation of VAD for authentication by biometric characteristics.

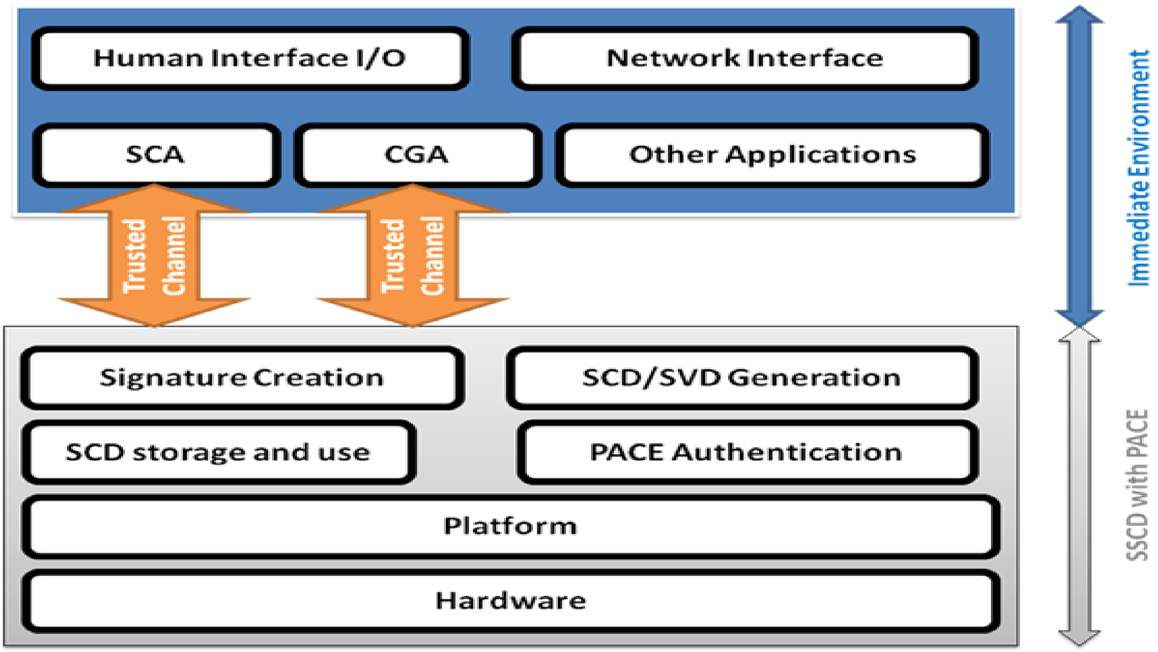


Figure 7: Scope of the SSCD

The security functionality of the TOE will be externally available to the user by APDU commands according to the access conditions specified by the appropriate policies considering the life cycle state, user role and security state.

3.5 Open and isolating Platform

This security target claims conformance to the Application Note 10 on Open and Isolating platform, issued by ANSSI [Note10].

An "open platform" can host new applications:

- Before its delivery to the end user (during phases 4, 5 or 6 of the traditional smartcard lifecycle). Such loadings are called "pre-issuance".
- After its delivery to the end user (phase 7). Such loadings are called "post-issuance".

An "isolating platform" is a platform that maintains the separation of the execution domains of all embedded applications on a platform, as of the platform itself. "Isolation" refers here to domain separation of applications as well as protection of application's data.

3.6 Major security features of the TOE

The TOE provides the following TOE security features:

3.6.1 Authentication mechanisms

This feature realizes the following authentication mechanisms [IAS ECC]:

- PIN verification,
- biometric characteristic verification and alternatively authentication with the PACE protocol,
- External Role authentication mechanisms
- Device authentication mechanisms

- Personalizer Authentication during the Phase 6 of the life cycle
- Terminal Authentication Version 2
- Chip Authentication Version 2

It also ensures that only authenticated terminals can get access to the user data stored on the TOE.

3.6.2 Cryptographic

This feature performs high level cryptographic operations (key generation, Signature Creation, destruction of cryptographic keys and random number generation). The implementation is mainly based on the Security Functionalities provided by the platform.

3.6.3 Trusted Channels

This feature realizes a secure communication channel to verify authenticity and integrity as well as securing confidentiality of user data between the TOE and other devices connected. The TOE provides:

- Secure messaging with external applications as CGA and SCA
- PACE used to establish session keys for secure messaging
- TDES for encryption/decryption and MAC generation/verification
- AES for encryption/decryption
- Chip Authentication used to establish session key for secure messaging

This feature is provided by the platform and used for secure messaging.

3.6.4 Access Control

This feature manages the access to objects (files, directories, data and secrets) stored in the ID.me file system. It ensures secure management of secrets such as cryptographic keys. Access control is enforced by the APDU methods as specified in the interface defined in the functional specification.

3.6.5 Data Storage

This feature manages the storage of manufacturing data, pre-personalization data and personalization data. This covers secure key storage.

3.6.6 Integrity

This feature monitors the integrity of sensitive user data and the integrity of the DTBS/R.

3.6.7 Features from the Platform

This contains all security functionalities provided by the certified platform (IC and Java Card operation system):

- Protection against malfunctions that are caused by exposure to operating conditions that may cause a malfunction. This includes hardware resets and operation outside the specified norms.
- Protection against tampering and the stored assets can not be retrieved or altered by physical manipulation
- Protection against physical attack and perform self tests as described in [ST-PL].
- Security domains are supported by the Java Card platform.
- Cryptographic operations: Signature generation, signature creation and secure messaging.

4 TOE Life Cycle

4.1 General

The TOE life cycle in Figure 8 distinguishes stages for development, production, preparation and operational use. The development and production of the TOE are subjects of CC evaluation according to the assurance life cycle (ALC) class. The development and production phases end with the delivery of the TOE to a SSCD-provisioning service provider. The functional integrity of the TOE shall be protected in delivering it to a SSCD-provisioning service provider: before any delivery occurs, the TOE is secured with a Transport Key. The SSCD-provisioning service will be able to unlock the card with the Transport Key before the preparation phase.

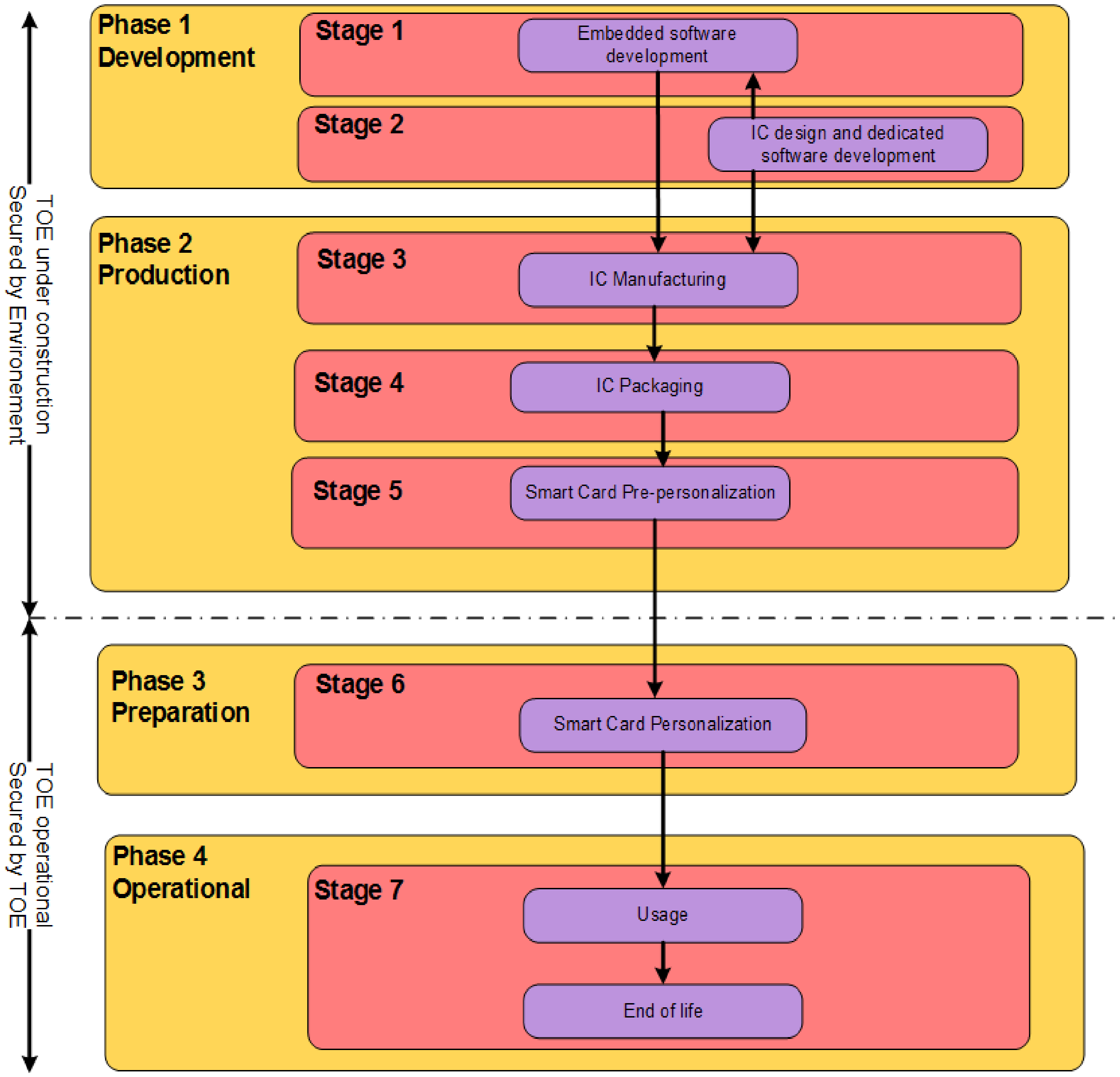


Figure 8: TOE Life Cycle

4.2 Development phase

This phase is composed of two stages:

- IC embedded software development (IDeal Citiz 2.17-I platform and ID.me applet)
- IC development

The IC Embedded Software Developer is in charge of:

- Specification, development and validation of the software (IDeal Citiz 2.17-I platform and ID.me applet).
- Specification of IC initialization requirements.

The IC Developer:

- Designs the IC, develops the IC dedicated software and provides information, software or tools to the IC embedded software developer.
- Receives the smartcard embedded software from the developer, through trusted delivery and verification procedures.

From the IC design, IC Dedicated Software and Smartcard Embedded Software, the IC Developer constructs the smartcard IC database, necessary for the IC photo mask fabrication.

Roles, Actors, Sites and coverage for this phase of the product life-cycle are listed in the table below:

Role	**Actor**	**Site**	**Covered by**
ID.me Applet Developer	IDEMIA	Osny & Noida R&D sites	ALC
Platform Developer	IDEMIA	Osny & Noida R&D sites	ALC
IC Developer	Infineon	Infineon development site(s) mentioned in [CR-IC]	ALC

4.3 Production phase

This phase is composed of three stages:

- IC manufacturing and testing
- IC Packaging
- Smartcard Prepersonalization & testing

The Platform Developer sends the image (platform) to be flashed in the IC to the IC manufacturer.

The whole package of ID.me (ID.me without PKI service and ID.me with PKI (IAS ECC) service and ID.me with PKI (EAC2) service) is also integrated in FLASH of the chip. Depending on the intention:

(a) the whole package of ID.me is securely delivered from the ID.me Applet Developer (IDEMIA R&D) to the IC manufacturer (Infineon). This applet delivery can be done at the same time as the platform delivery. The applet code will then be integrated into FLASH by the IC manufacturer.

Or

(b) the whole package of ID.me is securely delivered from the ID.me Applet Developer (IDEMIA R&D) to Smart Card Pre-personalizer (IDEMIA plants). The applet code will then be integrated into FLASH by the Smart Card Pre-personalizer.

The IC Manufacturer is responsible for producing the IC through three main steps:

- IC manufacturing,
- IC testing,
- IC Initialization.

The IC Packaging Manufacturer is responsible for IC packaging and testing.

The smartcard prepersonalizer is responsible for:
(i) [optional] in case of alternative (b), loading of the ID.me applet into FLASH,
(ii) prepersonalizing the smartcard and selecting the desired configuration (ID.me without PKI service or ID.me with PKI (IAS ECC) service or ID.me with PKI (EAC2) service). Hence, PKI services can be removed or added at this step.

Roles, Actors, Sites and coverage for this phase of the product life-cycle are listed in the table below:

Role	**Actor**	**Site**	**Covered by**
IC Manufacturer	Infineon	Infineon production site(s) mentioned in [CR-IC]	ALC
IC Packaging Manufacturer	Infineon or IDEMIA	Infineon production site(s) mentioned in [CR-IC] or IDEMIA plant (Haarlem, Ostrava, Noida, Shenzhen, Vitré)	ALC
Smart Card Pre-personalizer	IDEMIA	IDEMIA plant (Haarlem, Ostrava, Noida, Shenzhen, Vitré)	ALC
TOE Delivery Point			

4.4 Preparation phase (Phase 6 of the Platform life cycle)

This phase consists of:

1) Finishing process of the product (Composite product integration)
2) Personalization: RAD storage and VAD delivery processes
3) SCD initialization by the generation of SCD/SVD pair :
   a. By the TOE through the SCD/SVD generation functionality.
   b. By the CSP which loads the SCD to the TOE
4) export of SVD to CGA.

The IC contains in its FLASH all packages of ID.me applet.

During this phase, creation of ID.me SSCD applet instance is mandatory. This phase may also include the following additional activities:

- loading additional applets into the IC FLASH,
- creating instances of additional applets.

These additional applets will be tested before loading and they verifiably will not interfere with the ID.me SSCD applet. These additional applets are out of the scope of this certification.

4.5 Operational phase (Phase 7 of the Platform life cycle)

In this lifecycle stage the signatory can use the TOE to create advanced electronic signatures. The TOE operational use stage begins when the signatory has obtained both the VAD and the TOE. Enabling the TOE for signing requires at least one set of SCD stored in its memory.

The signatory can also interact with the SSCD to perform management tasks, e.g. reset a RAD value or use counter if the password/PIN in the reference data has been lost or blocked. Such management tasks require a secure environment. The signatory can render an SCD in the TOE permanently unusable. Rendering the last SCD in the TOE permanently unusable ends the life of the TOE as SSCD.

The TOE supports functions to generate additional signing keys. If the TOE supports these functions it shall support further functions to securely obtain certificates for the new keys. For an additional key the signatory may be allowed to choose the kind of certificate (qualified, or not) to obtain for the SVD of the new key. The signatory may also be allowed to choose some of the data in the certificate request for instance to use a pseudonym instead of the legal name in the certificate. If the conditions to obtain a qualified certificate are met the new key can also be used to create advanced electronic signatures. The optional TOE functions for additional key generation and certification may require additional security functions in the TOE and an interaction with the SSCD-provisioning service provider in an environment that is secure.

The TOE life cycle as SSCD ends when all set of SCD stored in the TOE are destructed. This may include deletion of the corresponding certificates.

5 Conformance Claims

5.1 CC Conformance

This Security Target claims conformance to the following documents defining the ISO/IEC 15408:2005 standard:

- Common Criteria for Information Technology Security Evaluation, Part 1: Introduction and general model. Version 3.1. Revision 5. April 2017. CCMB-2017-04-001.
- Common Criteria for Information Technology Security Evaluation, Part 2: Security functional requirements. Version 3.1. Revision 5. April 2017. CCMB-2017-04-002.
- Common Criteria for Information Technology Security Evaluation, Part 3: Security assurance requirements. Version 3.1. Revision 5. April 2017. CCMB-2017-04-003.
- Common Methodology for Information Technology Security Evaluation, Evaluation Methodology, CCMB-2012-09-004, Version 3.1, Revision, April 2017. CCMB-2017-04-004.

Conformance to ISO/IEC 15408:2005 is claimed as follows:

- Part 1: conformant
- Part 2: extended with
  - FPT_EMS.1 TOE Emanation [PP-SSCD2].
  - FCS_RND Quality metric for random numbers [PP-PACE].
  - FIA_API Authentication proof of identity [PP-SSCD4].
  - FMT_LIM - Limited capabilities [PP-PACE].

  All the other security requirements have been drawn from the catalogue of requirements in [CC2].
- Part 3: conformant, compliant to EAL5 augmented with
  - ALC_DVS.2 (Sufficiency of security measures)
  - AVA_VAN.5 (Advanced methodical vulnerability analysis)

The TOE also includes:

- Integrated Circuit IC: Infineon M7892 B11 [ST-IC]. The IC ST claims strict conformance to the security IC platform PP [PP-IC]. The assets, threats, objectives, SFR and security functions specific to the Infineon M7892 B11 are described in [ST-IC] and are not repeated in the current ST.
- Java Card Platform: IDeal Citiz 2.17-i open platform [ST-PL]. The PL ST claims demonstrable conformance to the security JC platform PP [PP-PL]. The assets, threats, objectives, SFR and security functions specific to the Platform are described in [ST-PL] and are not repeated in the current ST.

5.2 PP Claims

This security target is compliant with the following PPs:

- "Common Criteria Protection Profile for Secure Signature Creation Device – Part 2: Device with key generation" [PP-SSCD2].
- "Common Criteria Protection Profile for Secure Signature Creation Device – Part 3: Device with key import" [PP-SSCD3].
- "Common Criteria Protection Profile for Secure Signature Creation Device – Part 4: Extension for device with key generation and trusted communication with certificate generation application" [PP-SSCD4].

- "Common Criteria Protection Profile for Secure Signature Creation Device – Part 5: Extension for device with key generation and trusted communication with signature creation application" [PP-SSCD5].
- "Common Criteria Protection Profile for Secure Signature Creation Device – Part 6: Extension for device with key import and trusted communication with signature creation application" [PP-SSCD6].

5.3 Conformance Rationale

[PP-SSCD4] and [PP-SSCD5] are strictely conforming to the core PP-SSCD2 [PP-SSCD2]. [PP-SSCD6] is strictely conforming to the core PP-SSCD3 [PP-SSCD3]. This ST is claimed to be conformant to the above mentioned PPs [PP-SSCD2], [PP-SSCD3], [PP-SSCD4], [PP-SSCD5], [PP-SSCD6]. A detailed justification is given in the following:

1) The SPD of this ST contains the security problem definition [PP-SSCD2], [PP-SSCD3], [PP-SSCD4], [PP-SSCD5], [PP-SSCD6]. The SPD for this ST is described by the same threats, organisational security policies and assumptions as for the TOE in the PPs.

2) The security objectives for the TOE in this ST include all the security objectives for the TOE of the core PPs [PP-SSCD2] and [PP-SSCD3] and add
   a. the security objectives OT.TOE_TC_VAD_Imp and OT.TOE_TC_DTBS_Imp from [PP-SSCD5] and [PP-SSCD6],
   b. the security objectives OT.TOE_SSCD_Auth and OT.TOE_TC_SVD_Exp from [PP-SSCD4],

3) The assumptions in this ST include A.CSP from [PP-SSCD3] and [PP-SSCD6]. This assumption doesn't mitigate any threat and doesn't fulfil any OSP meant to be addressed by security objectives for the TOE in the other PPs.

4) The security objectives for the operational environment in this ST include all security objectives for the operational environment of the core PPs [PP-SSCD2] and [PP-SSCD3] except OE.HI_VAD, OE.DTBS_Protect and OE.SSCD_Prov_Service.
   - This ST adapts OE.HI_VAD and OE.DTBS_Protect to the support provided by the TOE by new security functionality (cf. OT.TOE_TC_VAD_Imp, OT.TOE_TC_DTBS_Imp) provided by the TOE and changes them into OE.HID_TC_VAD_Exp and OE.SCA_TC_DTBS_Exp ([PP-SSCD5] and [PP-SSCD6] for details).
   - OE.SSCD_Prov_Service is replaced by OE.Dev_Prov_Service from [PP-SCCD4].

   This ST also includes security objectives for the operational environment OE.CGA_SSCD_Auth and OE.CGA_TC_SVD_Imp from [PP-SSCD4]

5) The SFRs specified in this ST includes all security functional requirements (SFRs) specified in the core PPs [PP-SSCD2] and [PP-SSCD3]. Additional SFRs address :
   a. trusted channel between the TOE and the SCA from [PP-SSCD5] and [PP-SSCD6]: FDP_UIT.1/DTBS, FTP_ITC.1/VAD and FTP_ITC.1/DTBS.
   b. Trusted communication with CGA from [PP-SSCD4] : FIA_API.1 and FDP_DAU.2/SVD, FTP_ITC.1/SVD

6) This ST provides refinements for the SFR FIA_UAU.1 according to [PP-SSCD4], [PP-SSCD5] and [PP-SSCD6].

7) The security assurance requirements (SARs) are originally taken from SARs of part 3 [CC3] according to the package conformance EAL 5 augmented with ALC_DVS.2 and AVA_VAN.5 (the Evaluation Assurance Level EAL5+ of the current ST exceeds the EAL4+ defined by [PP-SSCD2], [PP-SSCD3], [PP-SSCD4], [PP-SSCD5], [PP-SSCD6]).

8) The additional functionalities (PACE authentication, Chip Authentication Protocol Version 2 and Terminal Authentication Protocol Version 2) have been added to the TOE with: (i) additional security problem definition; (ii) additional security objectives; (iii) additional SFRs. All these additions are inspired from the [EAC2-PP]. Notice that the added security objectives for the operational environment don't mitigate any threats of [PP-SSCD2], [PP-SSCD3], [PP-SSCD4], [PP-SSCD5], [PP-SSCD6] and don't fulfil any OSPs meant to be addressed by security objectives for the TOE in PP-SSCD2], [PP-SSCD3], [PP-SSCD4], [PP-SSCD5], [PP-SSCD6].

This security target is compliant with the SPD of [PP-SSCD2], [PP-SSCD3], [PP-SSCD4], [PP-SSCD5], [PP-SSCD6] as shown in the following table:

TOE SPDs	PP SSCD2	PP SSCD3	PP SSCD4	PP SSCD5	PP SSCD6	Included
Assumptions						
A.CGA	×		x	×		×
A.SCA	×		x	×		×
A.CSP		x			x	x
Threats						
T.SCD_Divulg	x	x	x	×	x	×
T.SCD_Derive	×	x	x	×	x	×
T.Hack_Phys	×	x	x	×	x	×
T.SVD_Forgery	×	x	x	×	x	×
T.SigF_Misuse	×	x	x	×	x	×
T.DTBS_Forgery	×	x	x	×	x	×
T.Sig_Forgery	×	x	x	×	x	×
Organisational Security Policies						
P.CSP_QCert	×	x	x	×	x	×
P.QSign	×	x	x	×	x	×
P.Sigy_SSCD	×	x	x	×	x	×
P.Sig_Non-Repud	×	x	x	×	x	×

Table 1 PP SPDs vs. ST

This security target is compliant with the security objectives of [PP-SSCD2], [PP-SSCD3], [PP-SSCD4], [PP-SSCD5], [PP-SSCD6] as shown in the following table:

TOE Objectives	PP SSCD2	PP SSCD3	PP SSCD4	PP SSCD5	PP SSCD6	Included
Objectives for the TOE						
OT.Lifecycle_Security	x	x	x	x	x	×
OT.SCD/SVD_Auth_Gen	x		x	x		×
OT.SCD_Unique	x		x	x		×
OT.SCD_SVD_Corresp	x		x	x		×
OT.SCD_Secrecy	x	x	x	x	x	×
OT.Sig_Secure	x	x	x	x	x	×
OT.Sigy_SigF	x	x	x	x	x	×
OT.DTBS_Integrity_TOE	x	x	x	x	x	×
OT.EMSEC_Design	x	x	x	x	x	×
OT.Tamper_ID	x	x	x	x	x	×
OT.Tamper_Resistance	x	x	x	x	x	×
OT.TOE_TC_VAD_Imp				×	x	×
OT.TOE_TC_DTBS_Imp				×	x	×
OT.TOE_SSCD_Auth			x			×
OT.TOE_TC_SVD_Exp			x			×
OT.SCD_Auth_Imp		x			x	x
Objectives for the Operational Environment						

TOE Objectives	PP SSCD2	PP SSCD3	PP SSCD4	PP SSCD5	PP SSCD6	Included
OE.SVD_Auth	×	×	×	×	×	×
OE.CGA_QCert	×	×	×	×	×	×
OE.SSCD_Prov_Service	×	×		×	×	
OE.SCD/SVD_Auth_Gen		×			×	×
OE.SCD_Unique		×			×	×
OE.SCD_SVD_Corresp		×			×	×
OE.SCD_Secrecy		x			x	×
OE.HID_VAD	×	×	×			
OE.DTBS_Intend	×	×	×	×	x	×
OE.DTBS_Protect	×	×	×			
OE.Signatory	×	×	×	×	×	×
OE.HID_TC_VAD_Exp				×	×	×
OE.SCA_TC_DTBS_Exp				×	×	×
OE.Dev_Prov_Service			x			x
OE.CGA_SSCD_Auth			x			×
OE.CGA_TC_SVD_Imp			x			×

Table 2 PP Security Objectives vs. ST

This security target is compliant with the security functional requirements of [PP-SSCD2], [PP-SSCD3], [PP-SSCD4], [PP-SSCD5], [PP-SSCD6] as shown in the following table:

TOE SFRs	PP SSCD2	PP SSCD3	PP SSCD4	PP SSCD5	PP SSCD6	Included
FCS_CKM.1	×		×	×		×
FCS_CKM.4	×	×	×	×	×	×
FCS_COP.1	×	×	×	×	×	×
FDP_ACC.1/SCD/SVD_Generation	×		×	×		×
FDP_ACF.1/SCD/SVD_Generation	×		×	×		×
FDP_ACC.1/SVD_Transfer	×		×	×		×
FDP_ACF.1/SVD_Transfer	×		×	×		×
FDP_ACC.1/Signature_Creation	×	×	×	×	×	×
FDP_ACF.1/Signature_Creation	×	×	×	×	×	×
FDP_ACC.1/SCD_Import		×			×	×
FDP_ACF.1/SCD_Import		×			×	×
FDP_RIP.1	×	×	×	×	×	×
FDP_SDI.2/Persistent	×	×	×	×	×	×
FDP_SDI.2/DTBS	×	×	×	×	×	×
FIA_UID.1	×	×	×	×	×	×
FIA_UAU.1	×	×	×	×	×	×
FIA_AFL.1	×	×	×	×	×	×
FMT_SMR.1	×	×	×	×	×	×
FMT_SMF.1	×	×	×	×	×	×
FMT_MOF.1	×	×	×	×	×	×
FMT_MSA.1/Admin	×	×	×	×	×	×

TOE SFRs	PP SSCD2	PP SSCD3	PP SSCD4	PP SSCD5	PP SSCD6	Included
FMT_MSA.1/Signatory	×	×	×	×	×	×
FMT_MSA.2	×	×	×	×	×	×
FMT_MSA.3	×	×	×	×	×	×
FMT_MSA.4	×	×	×	×	×	×
FMT_MTD.1/Admin	×	×	×	×	×	×
FMT_MTD.1/Signatory	×	×	×	×	×	×
FPT_EMS.1	×	×	×	×	×	×
FPT_FLS.1	×	×	×	×	×	×
FPT_PHP.1	×	×	×	×	×	×
FPT_PHP.3	×	×	×	×	×	×
FPT_TST.1	×	×	×	×	×	×
FIA_API.1			×			×
FTP_ITC.1/SVD			×			×
FDP_DAU.2/SVD			×			x
FDP_UIT.1/DTBS				×	×	×
FTP_ITC.1/VAD				×	×	×
FTP_ITC.1/DTBS				×	×	×
FDP_ITC.1/SCD		×				×
FDP_UCT.1/SCD		×				×
FTP_ITC.1/SCD		×				×
FCS_RND.1						×

Table 3 PP SFRs vs. ST

6 Security Problem Definition

6.1 Assets

6.1.1 Primary Assets

Following primary assets are protected by the TOE as listed below:

D.SCD

Signature Creation Data

Private key used to perform an electronic signature operation. The confidentiality, integrity and signatory's sole control over the use of the SCD must be maintained.

D.SVD

Signature Verification Data

Public key linked to the SCD and used to perform electronic signature verification. The integrity of the SVD when it is exported must be maintained.

D.DTBS/R

Data to be signed or its unique Representation

Set of data, or its representation, which the signatory intends to sign. Their integrity and the unforgeability of the link to the signatory provided by the electronic signature must be maintained.

6.1.2 Primary Assets related to EAC2

Authenticity of the Electronic Documents Chip

The authenticity of the electronic document’s chip, personalized by the issuing state or organization for the electronic document holder, is used by the electronic document presenter to prove his possession of a genuine electronic document.

Generic Security Property: Authenticity

Tracing Data

Technical information about the current and previous locations of the electronic document gathered unnoticeable by the electronic document holder recognizing the TOE not knowing any PACE password. TOE tracing data can be provided / gathered.

Generic Security Property: Unavailability

Sensitive User Data

User data, which have been classified as sensitive data by the electronic document issuer, e. g. sensitive biometric data. Sensitive user data are a subset of all user data, and are protected by EAC2.

Generic Security Properties: Confidentiality, Integrity, Authenticity

User Data stored on the TOE

All data, with the exception of authentication data, that are stored in the context of the application(s) on the electronic document. These data are allowed to be accessed either by a PACE terminal, or, in the case of sensitive data, by an EAC2 terminal with appropriate authorization level.

Generic Security Properties: Confidentiality, Integrity, Authenticity

User Data transferred between the TOE and the Terminal

All data, with the exception of authentication data, that are transferred (both directions) during usage of the application(s) of the electronic document between the TOE and authenticated terminals.

Generic Security Properties: Confidentiality, Integrity, Authenticity

6.1.3 Secondary Assets related to EAC2

In order to achieve a sufficient protection of the primary assets, the following secondary assets also are protected by the TOE.

Accessibility of TOE Functions and Data only for Authorized Subjects

Property of the TOE to restrict access to TSF and TSF-Data stored in the TOE to authorized subjects only.

Generic Security Property: Availability

Genuineness of the TOE

Property of the TOE to be authentic in order to provide claimed security functionality in a proper way.

Generic Security Property: Availability

Electronic Document Communication Establishment Authorization Data

Restricted-revealable authorization information for a human user used for verification of the authorization attempts as an authorized user (PACE password). These data are stored in the TOE and not send to it.

Restricted-revealable here refers to the fact that if necessary, the electronic document holder may reveal her verification values of CAN and MRZ to an authorized person, or to a device that acts according to respective regulations and is considered trustworthy.

Generic Security Properties: Confidentiality, Integrity

Secret Electronic Document Holder Authentication Data

Secret authentication information for the electronic document holder being used for verification of the authentication attempts as authorized electronic document holder (sent PACE passwords, e.g. PIN or CAN).

Generic Security Properties: Confidentiality, Integrity

TOE internal Non-Secret Cryptographic Material

Permanently or temporarily stored non-secret cryptographic (public) keys and other non-secret material used by the TOE in order to enforce its security functionality. An example for such non-secret material is the document security object (SOD) that contains a digital signature.

Generic Security Properties: Integrity, Authenticity

TOE internal Secret Cryptographic Keys

Permanently or temporarily stored secret cryptographic material used by the TOE in order to enforce its security functionality.

Generic Security Properties: Confidentiality, Integrity

Application Note:

Data for electronic document holder authentication and for authorization of communication with the electronic document can be categorized as (i) reference information that are persistently stored within the TOE, and (ii) verification information for the TOE that are input by a human user during an authentication and/or authorization attempt. The TOE shall secure both reference information, and, together with the connected terminal, verification information that are transferred in the channel between the TOE and the terminal.

6.2 Users / Subjects

6.2.1 Users/Subjects related to EAC2

S.CSCA

Country Signing Certification Authority

An organization enforcing the policy of the electronic document issuer, i. e. confirming correctness of user and TSF data that are stored within the electronic document. The CSCA represents the country specific root of the public key infrastructure (PKI) for the electronic document, and creates Document Signer Certificates within this PKI. The CSCA also issues a self-signed CSCA certificate that has to be distributed to other countries by secure diplomatic means, see [ICAO-9303].

S.CVCA

Country Verifying Certification Authority

The Country Verifying Certification Authority (CVCA) enforces the privacy policy of the issuing state or organization, i. e. enforcing protection of sensitive user data that are stored in the electronic document. The CVCA represents the country specific root of the PKI of EAC2 terminals, and creates Document Verifier Certificates within this PKI. Updates of the public key of the CVCA are distributed as CVCA Link-Certificates, see [TR03110-3].

S.DS

Document Signer

An organization enforcing the policy of the CSCA. A DS signs the Document Security Object (SOD) that is stored on the electronic document for Passive Authentication. A Document Signer is authorized by the national CSCA that issues Document Signer Certificates, see [ICAO-9303]. Note that this role is usually delegated to a Personalization Agent.

S.DV

Document Verifier

An organization issuing terminal certificates. The DV is a Certificate Authority, authorized by the corresponding CVCA to issue certificates for EAC2 terminals, see [TR03110-3].

S.EDH

Electronic Document Holder

A person who the electronic document issuer has personalized the electronic document for. Personalization here refers to associating a person uniquely with a specific electronic document. Note that an electronic document holder can also be an attacker.

S.EDP

Electronic Document Presenter

A person presenting the electronic document to a terminal and claiming the identity of the electronic document holder. Note that an electronic document presenter can also be an attacker, cf. below.

S.Manufacturer

Generic term comprising both the IC manufacturer that produces the integrated circuit, and the electronic document manufacturer that creates the electronic document and attaches the IC to it. The manufacturer is the default user of the TOE during the manufacturing life cycle phase. When referring to the role manufacturer, the TOE itself does not distinguish between the IC manufacturer and the electronic document manufacturer.

S.PACE Terminal

A PACE terminal implements the terminal part of the PACE protocol, and authenticates itself to the electronic document using a shared password (CAN, PIN, PUK or MRZ). A PACE terminal is not allowed to access sensitive user data.

S.Personalization Agent

An organization acting on behalf of the electronic document issuer that personalizes the electronic document for the electronic document holder. Personalization includes some or all of the following activities: (i) establishing the identity of the electronic document holder for the biographic data in the electronic document, (ii) enrolling the biometric reference data of the electronic document holder, (iii) writing a subset of these data on the physical electronic document (optical personalization) and storing them within the electronic document's chip (electronic personalization), (iv) writing document meta data (i. e. document type, issuing country, expiry date, etc.) (v) writing the initial TSF data, and (vi) signing the Document Security Object, and the elementary files EF.CardSecurity and the EF.ChipSecurity (if applicable [ICAO-9303], [TR03110-3]) in the role DS. Note that the role personalization agent may be distributed among several institutions according to the operational policy of the electronic document issuer.

S.EAC2 Terminal

A terminal that has successfully passed Terminal Authentication 2 is an EAC2 terminal. It is authorized by the electronic document issuer through the Document Verifier of the receiving branch (by issuing terminal certificates) to access a subset or all of the data stored on the electronic document.

S.Terminal

A terminal is any technical system communicating with the TOE through the contactless or contact-based interface. The role terminal is the default role for any terminal being recognized by the TOE that is neither a PACE terminal nor an EAC2 terminal.

6.2.2 Threat agents

S.Attacker

Human or process acting on their behalf located outside the TOE. The main goal of the attacker is to access the SCD or to falsify the electronic signature. The attacker has got a high attack potential and knows no secret.

6.2.3 Miscellaneous

S.User

End user of the TOE who can be identified as administrator or signatory. The subject S.User may act as S.Admin in the role R.Admin or as S.Sigy in the role R.Sigy.

S.Admin

User who is in charge to perform the TOE initialisation, TOE personalisation or other TOE administrative functions. The subject S.Admin is acting in the role R.Admin for this user after successful authentication as administrator.

S.Signatory

User who hold the TOE and use it on their own behalf or on behalf of the natural or legal person or entity they represent. The subject S.Sigy is acting in the role R.Sigy for this user after successful authentication as signatory.

6.3 Threats

6.3.1 Threats related to EAC2

T.Counterfeit/EAC2

An attacker with high attack potential produces an unauthorized copy or reproduction of a chip of a genuine electronic document. This copy or reproduction can be used as a part of a counterfeit electronic document. This violates the authenticity of the electronic document's chip used for authentication of a electronic document presenter by possession of an electronic document.The attacker may generate a new data set or extract completely or partially the data from a genuine electronic document’s chip and copy them to another appropriate chip to imitate the chip of the genuine electronic document.

Threat agent:having high attack potential, being in possession of one or more legitimate ID-Cards

T.Sensitive_Data

An attacker tries to gain access to sensitive user data through the communication interface of the electronic document's chip.The attack T.Sensitive_Data is similar to the threat T.Skimming from [PACEPP] w.r.t. the attack path (communication interface) and the motivation (to get data stored on the electronic document's chip) but differs from those in the asset under the attack (sensitive data vs. digital MRZ, digitized portrait and other data), the opportunity (i.e. knowing the PACE Password) and therefore the possible attack methods.

Threat agent:having high attack potential, knowing the PACE Password, being in possession of a legitimate electronic document

T.Abuse-Func

An attacker may use functions of the TOE which shall not be used in TOE operational phase in order (i) to manipulate or to disclose the User Data stored in the TOE, (ii) to manipulate or to disclose the TSF-data stored in the TOE or (iii)to manipulate (bypass, deactivate or modify) soft-coded security functionality of the TOE. This threat addresses the misuse of the functions for the initialisation and personalisation in the operational phase after delivery to the travel document holder.

T.Eavesdropping

An attacker is listening to the communication between the travel document and the PACE authenticated BIS-PACE in order to gain the user data transferred between the TOE and the terminal connected.

T.Forgery

An attacker fraudulently alters the User Data or/and TSF-data stored on the travel document or/and exchanged between the TOE and the terminal connected in order to outsmart the PACE authenticated BIS-PACE by means of changed travel document holder's related reference data (like biographic or biometric data). The attacker does it in such a way that the terminal connected perceives these modified data as authentic one.

T.Information_Leakage

An attacker may exploit information leaking from the TOE during its usage in order to disclose confidential User Data or/and TSF-data stored on the travel document or/and exchanged between the TOE and the terminal connected. The information leakage may be inherent in the normal operation or caused by the attacker.

T.Malfunction

An attacker may cause a malfunction the travel document's hardware and Embedded Software by applying environmental stress in order to (i) deactivate or modify security features or functionality of the TOE' hardware or to (ii) circumvent, deactivate or modify security functions of the TOE's Embedded Software. This may be achieved e.g. by operating the travel document outside the normal operating conditions, exploiting errors in the travel document's Embedded Software or misusing administrative functions. To exploit these vulnerabilities an attacker needs information about the functional operation.

T.Phys-Tamper

An attacker may perform physical probing of the travel document in order (i) to disclose the TSF-data, or (ii) to disclose/reconstruct the TOE's Embedded Software. An attacker may physically modify the travel document in order to alter (I) its security functionality (hardware and software part, as well), (ii) the User Data or the TSF-data stored on the travel document.

T.Skimming

An attacker imitates an inspection system in order to get access to the user data stored on or transferred between the TOE and the inspecting authority connected via the contactless/contact interface of the TOE.

T.Tracing

An attacker tries to gather TOE tracing data (i.e. to trace the movement of the travel document) unambiguously identifying it remotely by establishing or listening to a communication via the contactless/contact interface of the TOE.

6.3.2 Miscellaneous

T.SCD_Divulg

Storing, copying and releasing of the signature creation data

An attacker stores or copies the SCD outside the TOE. An attacker can obtain the SCD during generation, storage and use for signature creation in the TOE.

T.SCD_Derive

Derive the signature creation data

An attacker derives the SCD from publicly known data, such as SVD corresponding to the SCD or signatures created by means of the SCD or any other data exported outside the TOE, which is a threat against the secrecy of the SCD.

T.Hack_Phys

Physical attacks through the TOE interfaces

An attacker interacts physically with the TOE to exploit vulnerabilities, resulting in arbitrary security compromises. This threat is directed against SCD, SVD and DTBS.

T.SVD_Forgery

Forgery of the signature verification data

An attacker forges the SVD presented by the CSP to the CGA. This results in loss of SVD integrity in the certificate of the signatory.

T.SigF_Misuse

Misuse of the signature creation function of the TOE

An attacker misuses the signature creation function of the TOE to create SDO for data the signatory has not decided to sign. The TOE is subject to deliberate attacks by experts possessing a high attack potential with advanced knowledge of security principles and concepts employed by the TOE.

T.DTBS_Forgery

Forgery of the DTBS/R

An attacker modifies the DTBS/R sent by the SCA. Thus the DTBS/R used by the TOE for signing does not match the DTBS the signatory intended to sign.

T.Sig_Forgery

Forgery of the electronic signature

An attacker forges a signed data object, maybe using an electronic signature which has been created by the TOE, and the violation of the integrity of the signed data object is not detectable by the signatory or by third parties. The signature created by the TOE is subject to deliberate attacks by experts possessing a high attack potential with advanced knowledge of security principles and concepts employed by the TOE.

6.4 Organisational Security Policies

6.4.1 OSP related to EAC2

P.EAC2_Terminal

Terminals that intent to be EAC2 terminals must implement the respective terminal part of the protocols required to execute EAC version 2 according to [TR03110-2], and store (static keys) or generate (temporary keys and nonces) the corresponding credentials.

P.Terminal_PKI

The electronic document issuer shall establish a public key infrastructure for the card verifiable certificates used for Terminal Authentication. For this aim, the electronic document issuer shall run a Country Verifying Certification Authority. The instances of the PKI shall fulfill the requirements and rules of the corresponding certificate policy. The electronic document issuer shall make the CVCA certificate available to the personalization agent or the manufacturer.

P.Card_PKI

PKI for Passive Authentication (issuing branch)

The description below states the responsibilities of involved parties and represents the logical, but not the physical structure of the PKI. Physical distribution ways shall be implemented by the involved parties in such a way that all certificates belonging to the PKI are securely distributed / made available to their final destination, e.g. by using directory services. 1.)The travel document Issuer shall establish a public key infrastructure for the passive authentication, i.e. for digital signature creation and verification for the travel document. For this aim, he runs a Country Signing Certification Authority (CSCA). The travel document Issuer shall publish the CSCA Certificate (CCSCA). 2.)The CSCA shall securely generate, store and use the CSCA key pair. The CSCA shall keep the CSCA Private Key secret and issue a self-signed CSCA Certificate (CCSCA) having to be made available to the travel document Issuer by strictly secure means, see [6], 5.5.1. The CSCA shall create the Document Signer Certificates for the Document Signer Public Keys (CDS) and make them available to the travel document Issuer, see [6], 5.5.1. 3.)A Document Signer shall (i) generate the Document Signer Key Pair, (ii) hand over the Document Signer Public Key to the CSCA for certification, (iii) keep the Document Signer Private Key secret and (iv) securely use the Document Signer Private Key for signing the Document Security Objects of travel documents.

P.Manufact

The Initialization Data are written by the IC Manufacturer to identify the IC uniquely. The travel document Manufacturer writes the Pre-personalisation Data which contains at least the Personalisation Agent Key.

P.Pre-Operational

1.)The travel document Issuer issues the travel document and approves it using the terminals complying with all applicable laws and regulations.

2.)The travel document Issuer guarantees correctness of the user data (amongst other of those, concerning the travel document holder) and of the TSF-data permanently stored in the TOE28.

3.)The travel document Issuer uses only such TOE's technical components (IC) which enable traceability of the travel documents in their manufacturing and issuing life cycle phases, i.e. before they are in the operational phase, cf. sec. 1.2.3 above.

4.)If the travel document Issuer authorises a Personalisation Agent to personalise the travel document for travel document holders, the travel document Issuer has to ensure that the Personalisation Agent acts in accordance with the travel document Issuer's policy.

P.Terminal

The Basic Inspection Systems with PACE (BIS-PACE) shall operate their terminals as follows:

1.)The related terminals (basic inspection system, cf. above) shall be used by terminal operators and by travel document holders as defined in [6].

2.)They shall implement the terminal parts of the PACE protocol [4], of the Passive Authentication [6] and use them in this order29. The PACE terminal shall use randomly and (almost) uniformly selected nonces, if required by the protocols (for generating ephemeral keys for Diffie-Hellmann).

3.)The related terminals need not to use any own credentials.

4.)They shall also store the Country Signing Public Key and the Document Signer Public Key (in form of CCSCA and CDS) in order to enable and to perform Passive Authentication (determination of the authenticity of data groups stored in the travel document, [6]).

5.)The related terminals and their environment shall ensure confidentiality and integrity of respective data handled by them (e.g. confidentiality of PACE passwords, integrity of PKI certificates, etc.), where it is necessary for a secure operation of the TOE according to the current PP.

P.Trustworthy_PKI

The CSCA shall ensure that it issues its certificates exclusively to the rightful organisations (DS) and DSs shall ensure that they sign exclusively correct Document Security Objects to be stored on the travel document.

6.4.2 Miscellaneous

P.CSP_QCert

Qualified certificate

The CSP uses a trustworthy CGA to generate a qualified certificate or non-qualified certificate (cf. the directive, article 2, clause 9, and Annex I [DIR]) for the SVD generated by the SSCD. The certificates contain at least the name of the signatory and the SVD matching the SCD implemented in the TOE under sole control of the signatory. The CSP ensures that the use of the TOE as SSCD is evident with signatures through the certificate or other publicly available information.

P.QSign

Qualified electronic signatures

The signatory uses a signature creation system to sign data with an advanced electronic signature (cf. the directive, article 1, clause 2 [DIR]), which is a qualified electronic signature if it is based on a valid qualified certificate (according to the directive Annex I [DIR]). The DTBS are presented to the signatory and sent by the SCA as DTBS/R to the SSCD. The SSCD creates the electronic signature created with a SCD implemented in the SSCD that the signatory maintain under their sole control and is linked to the DTBS/R in such a manner that any subsequent change of the data is detectable.

Application Note:

It is a non-qualified advanced electronic signature if it is based on a non-qualified certificate for the SVD.

P.Sigy_SSCD

TOE as secure signature creation device

The TOE meets the requirements for an SSCD laid down in Annex III of the directive [DIR]. This implies the SCD is used for digital signature creation under sole control of the signatory and the SCD can practically occur only once.

P.Sig_Non-Repud

Non-repudiation of signatures

The lifecycle of the SSCD, the SCD and the SVD shall be implemented in a way that the signatory is not able to deny having signed data if the signature is successfully verified with the SVD contained in their unrevoked certificate.

6.5 Assumptions

6.5.1 All SSCD parts

A.CGA

Trustworthy certificate generation application

The CGA protects the authenticity of the signatory's name or pseudonym and the SVD in the (qualified) certificate by an advanced electronic signature of the CSP.

A.SCA

Trustworthy signature creation application

The signatory uses only a trustworthy SCA. The SCA generates and sends the DTBS/R of data the signatory wishes to sign in a form appropriate for signing by the TOE.

6.5.2 Parts 3 and 6 only

A.CSP

Secure SCD/SVD management by CSP

The CSP uses only a trustworthy SCD/SVD generation device and ensures that this device can be used by authorised user only. The CSP ensures that the SCD generated practically occurs only once, that generated SCD and SVD actually correspond to each other and that SCD cannot be derived from the SVD. The CSP ensures the confidentiality of the SCD during generation and export to the TOE, does not use the SCD for creation of any signature and irreversibly deletes the SCD in the operational environment after export to the TOE.

7 Security Objectives

7.1 Security Objectives for the TOE

7.1.1 All SSCD parts

OT.Tamper_Resistance

Tamper resistance

The TOE shall prevent or resist physical tampering with specified system devices and components.

OT.Tamper_ID

Tamper detection

The TOE shall provide system features that detect physical tampering of its components, and uses those features to limit security breaches.

OT.EMSEC_Design

Provide physical emanations security

The TOE shall be designed and built in such a way as to control the production of intelligible emanations within specified limits.

OT.DTBS_Integrity_TOE

DTBS/R integrity inside the TOE

The TOE must not alter the DTBS/R. As by definition of the DTBS/R this may consist of the DTBS themselves, this objective does not conflict with a signature creation process where the TOE hashes the provided DTBS (in part or entirely) for signature creation.

OT.Sigy_SigF

Signature creation function for the legitimate signatory only

The TOE shall provide the digital signature creation function for the legitimate signatory only and protects the SCD against the use of others. The TOE shall resist attacks with high attack potential.

OT.Sig_Secure

Cryptographic security of the electronic signature

The TOE shall create digital signatures that cannot be forged without knowledge of the SCD through robust encryption techniques. The SCD shall not be reconstructable using the digital signatures or any other data exportable from the TOE. The digital signatures shall be resistant against these attacks, even when executed with a high attack potential.

OT.SCD_Secrecy

Secrecy of the signature-creation data

The secrecy of the SCD (used for signature creation) shall be reasonably assured against attacks with a high attack potential.

Application Note:

The TOE shall keep the confidentiality of the SCD at all times, in particular during SCD/SVD generation, signature creation operation, storage and secure destruction.

OT.Lifecycle_Security

Lifecycle security

The TOE shall detect flaws during the initialisation, personalisation and operational usage. The TOE shall securely destroy the SCD on demand of the signatory.

Application Note:

The TOE may contain more than one set of SCD. There is no need to destroy the SCD in case of repeated SCD generation. The signatory shall be able to destroy the SCD stored in the SSCD e.g. after the (qualified) certificate for the corresponding SVD has been expired.

7.1.2 SSCD parts 2, 4 and 5 only

OT.SCD_SVD_Corresp

Correspondence between SVD and SCD

The TOE shall ensure the correspondence between the SVD and the SCD generated by the TOE. This includes unambiguous reference of a created SVD/SCD pair for export of the SVD and in creating an electronic signature creation with the SCD.

OT.SCD_Unique

Uniqueness of the signature creation data

The TOE shall ensure the cryptographic quality of an SCD/SVD pair it creates as suitable for the advanced or qualified electronic signature. The SCD used for signature creation shall practically occur only once and shall not be reconstructable from the SVD. In that context 'practically occur once' means that the probability of equal SCDs is negligible.

OT.SCD/SVD_Gen

Authorized SCD/SVD generation

The TOE shall provide security features to ensure that authorised users only may invoke the generation of the SCD and the SVD.

7.1.3 SSCD parts 3 and 6 only

OT.SCD_Auth_Imp

Authorized SCD import

The TOE shall provide security features to ensure that authorised users only may invoke the import of the SCD.

Application Note:

Authorized SCD import

The TOE shall provide security features to ensure that authorised users only may invoke the import of the SCD.

7.1.4 SSCD part 4 only

OT.TOE_SSCD_Auth

Authentication proof as SSCD

The TOE shall hold unique identity and authentication data as SSCD and provide security mechanisms to identify and to authenticate itself as SSCD.

OT.TOE_TC_SVD_Exp

TOE trusted channel for SVD export

The TOE shall provide a trusted channel to the CGA to protect the integrity of the SVD exported to the CGA. The TOE shall enable the CGA to detect alteration of the SVD exported by the TOE.

7.1.5 SSCD parts 5 and 6 only

OT.TOE_TC_VAD_Imp

Trusted channel of TOE for VAD import

The TOE shall provide a trusted channel for the protection of the confidentiality and integrity of the VAD received from the HID as needed by the authentication method employed.

Application Note:

This security objective for the TOE is partly covering OE.HID_VAD from the core PPs (PP Part2 SSCD KG and PP Part3 SSCD KI). While OE.HID_VAD in the core PP requires only the operational environment to protect VAD, this ST requires the HID and the TOE to implement a trusted channel for the protection of the VAD: the HID exports the VAD and establishes one end of the trusted channel according to OE.HID_TC_VAD_Exp, the TOE imports VAD at the other end of the trusted channel according to OT.TOE_TC_VAD_Imp. Therefore this ST re-assigns partly the VAD protection from the operational environment as described by OE.HID_VAD to the TOE as described by OT.TOE_TC_VAD_Imp and leaves only the necessary functionality by the HID.

OT.TOE_TC_DTBS_Imp

Trusted channel of TOE for DTBS import

The TOE shall provide a trusted channel to the SCA to detect alteration of the DTBS/R received from the SCA. The TOE must not generate electronic signatures with the SCD for altered DTBS.

7.1.6 Security Objectives OT related to EAC2

OT.AC_Pers_EAC2

Personalization of the Electronic Document

The TOE must ensure that user data and TSF-Data that are permanently stored in the TOE can be written by authorized personalization agents only, with the following exception: An EAC2 terminal may also write or modify user data according to its effective access rights. The access rights are determined by the electronic document during Terminal Authentication 2. Justification: This security objective for the TOE modifies

OT.AC_Pers from [PACEPP] as the additional features of EAC2 allow a strongly controlled, secure and fine-grained access to individual data groups of the electronic document.

OT.CA2

Proof of the Electronic Document's Chip Authenticity

The TOE must allow EAC2 terminals to verify the identity and authenticity of the electronic document's chip as being issued by the identified issuing state or organization by Chip Authentication 2 [TR03110-2]. The authenticity of the chip and its proof mechanism provided by the electronic document's chip shall be protected against attacks with high attack potential.

OT.Sens_Data_EAC2

Confidentiality of sensitive User Data

The TOE must ensure confidentiality of sensitive user data by granting access to sensitive data only to EAC2 terminals with corresponding access rights. The authorization of an EAC2 terminal is the minimum set of the access rights drawn from the terminal certificate used for successful authentication and the corresponding DV and CVCA certificates, and the access rights sent to the electronic document as part of PACE. The TOE must ensure confidentiality of all user data during transmission to an EAC2 terminal after Chip Authentication 2. Confidentiality of sensitive user data shall be protected against attacks with high attack potential.

OT.Data_Authenticity

Authenticity of Data

The TOE must ensure authenticity of the User Data and the TSF-data stored on it by enabling verification of their authenticity at the terminal-side32.The TOE must ensure authenticity of the User Data and the TSF-data during their exchange between the TOE and the terminal connected (and represented by PACE authenticated BIS-PACE) after the PACE Authentication. It shall happen by enabling such a verification at the terminal-side (at receiving by the terminal) and by an active verification by the TOE itself (at receiving by the TOE).

OT.Data_Confidentiality

Confidentiality of Data

The TOE must ensure confidentiality of the User Data and the TSF-data by granting read access only to the PACE authenticated BIS-PACE connected.The TOE must ensure confidentiality of the User Data and the TSF-data during their exchange between the TOE and the terminal connected (and represented by PACE authenticated BIS-PACE) after the PACE Authentication.

OT.Data_Integrity

Integrity of Data

The TOE must ensure integrity of the User Data and the TSF-data stored on it by protecting these data against unauthorised modification (physical manipulation and unauthorised modifying).The TOE must ensure integrity of the User Data and the TSF-data during their exchange between the TOE and the terminal connected (and represented by PACE authenticated BIS-PACE) after the PACE Authentication.

OT.Identification

IIdentification of the TOE

The TOE must provide means to store Initialisation36 and Pre-Personalisation Data in its non-volatile memory. The Initialisation Data must provide a unique identification of the IC during the manufacturing and the card issuing life cycle phases of the travel document. The storage of the Pre-Personalisation data includes writing of the Personalisation Agent Key(s).

OT.Prot_Abuse-Func

Protection against Abuse of Functionality

The TOE must prevent that functions of the TOE, which may not be used in TOE operational phase, can be abused in order (i) to manipulate or to disclose the User Data stored in the TOE, (ii) to manipulate or to disclose the TSF-data stored in the TOE, (iii) to manipulate (bypass, deactivate or modify) soft-coded security functionality of the TOE.

OT.Prot_Inf_Leak

Protection against Information Leakage

The TOE must provide protection against disclosure of confidential User Data or/and TSF-data stored and/or processed by the travel document

- by measurement and analysis of the shape and amplitude of signals or the time between events found by measuring signals on the electromagnetic field, power consumption, clock, or I/O lines,
- by forcing a malfunction of the TOE and/or
- by a physical manipulation of the TOE.

Application Note:

This objective pertains to measurements with subsequent complex signal processing due to normal operation of the TOE or operations enforced by an attacker.

OT.Prot_Malfunction

Protection against Malfunctions

The TOE must ensure its correct operation. The TOE must prevent its operation outside the normal operating conditions where reliability and secure operation have not been proven or tested. This is to prevent functional errors in the TOE. The environmental conditions may include external energy (esp. electromagnetic) fields, voltage (on any contacts), clock frequency or temperature. The following TOE security objectives address the aspects of identified threats to be countered involving TOE's environment.

OT.Prot_Phys-Tamper

Protection against Physical Tampering

The TOE must provide protection of confidentiality and integrity of the User Data, the TSF-data and the travel document's Embedded Software by means of

- measuring through galvanic contacts representing a direct physical probing on the chip's surface except on pads being bonded (using standard tools for measuring voltage and current) or

- measuring not using galvanic contacts, but other types of physical interaction between electrical charges (using tools used in solid-state physics research and IC failure analysis),
- manipulation of the hardware and its security functionality, as well as
- controlled manipulation of memory contents (User Data, TSF-data)with a prior
- reverse-engineering to understand the design and its properties and functionality.

OT.Tracing

Tracing travel document

The TOE must prevent gathering TOE tracing data by means of unambiguous identifying the travel document remotely through establishing or listening to a communication via the contactless/contact interface of the TOE without knowledge of the correct values of shared passwords (PACE passwords) in advance.

Application Note:

Since the Standard Inspection Procedure does not support any unique-secret-based authentication of the travel document’s chip (no Chip Authentication), a security objective like OT.Chip_Auth_Proof (proof of travel document authenticity)35 cannot be achieved by the current TOE.

7.2 Security Objectives for the Operational Environment

7.2.1 All SSCD parts

OE.Signatory

Security obligation of the signatory

The signatory shall check that the SCD stored in the SSCD received from SSCD-provisioning service is in non-operational state. The signatory shall keep their VAD confidential.

OE.DTBS_Intend

SCA sends data intended to be signed

The signatory shall use a trustworthy SCA that

- generates the DTBS/R of the data that has been presented as DTBS and which the signatory intends to sign in a form which is appropriate for signing by the TOE,
- sends the DTBS/R to the TOE and enables verification of the integrity of the DTBS/R by the TOE,
- attaches the signature produced by the TOE to the data or provides it separately.

Application Note:

The SCA should be able to support advanced electronic signatures. Currently, there exist three formats defined by ETSI recognized as meeting the requirements needed by advanced electronic signatures: CAdES, XAdES and PAdES. These three formats mandate to include the hash of the signer's public key certificate in the data to be signed. In order to support for the mobility of the signer, it is recommended to store the certificate info on the SSCD for use by SCA and identification of the corresponding SCD if more than one SCD is stored on the SSCD.

OE.SVD_Auth

Authenticity of the SVD The operational environment shall ensure the integrity of the SVD sent to the CGA of the CSP. The CGA verifies the correspondence between the SCD in the SSCD of the signatory and the SVD in the qualified certificate.

OE.CGA_QCert

Generation of qualified certificates

The CGA shall generate a qualified certificate that includes (amongst others)

- the name of the signatory controlling the TOE,
- the SVD matching the SCD stored in the TOE and being under sole control of the signatory,
- the advanced signature of the CSP.

The CGA shall confirm with the generated qualified certificate that the SCD corresponding to the SVD is stored in a SSCD.

7.2.2 SSCD parts 3 and 6 only

OE.SCD_SVD_Corresp

Correspondence between SVD and SCD

The CSP shall ensure the correspondence between the SVD and the SCD generated by the CSP. This includes the correspondence between the SVD sent to the CGA and the SCD exported to the TOE of the signatory identified in the SVD certificate.

OE.SCD_Unique

Uniqueness of the signature creation data

The CSP shall ensure the cryptographic quality of the SCD/SVD pair, which is generated in the environment, for the qualified or advanced electronic signature. The SCD used for signature creation shall practically occur only once, i.e. the probability of equal SCDs shall be negligible, and the SCD shall not be reconstructable from the SVD.

OE.SCD_Secrecy

SCD Secrecy

The CSP shall protect the confidentiality of the SCD during generation and export to the TOE. The CSP shall not use the SCD for creation of any signature and shall irreversibly delete the SCD in the operational environment after export to the TOE.

OE.SCD/SVD_Auth_Gen

Authorized SCD/SVD generation

The CSP shall provide security features to ensure that authorised users only may invoke the generation of the SCD and the SVD.

7.2.3 SSCD part 4 only

OE.Dev_Prov_Service

Authentic SSCD provided by SSCD Provisioning Service

The SSCD Provisioning Service handles authentic devices that implement the TOE, prepares the TOE for proof as SSCD to external entities, personalises the TOE for the legitimate user as signatory, links the identity of the TOE as SSCD with the identity of the legitimate user, and delivers the TOE to the signatory.

Application Note:

This objective replaces OE.SSCD_Prov_Service from the core PP, which is possible as it does not imply any additional requirements for the operational environment when compared to OE.SSCD_Prov_Service (OE.Dev_Prov_Service is a subset of OE.SSCD_Prov_Service).

OE.CGA_TC_SVD_Imp

CGA trusted channel for SVD import

The CGA shall detect alteration of the SVD imported from the TOE with the claimed identity of the SSCD.

OE.CGA_SSCD_Auth

Pre-initialisation of the TOE for SSCD authentication

The CSP shall check by means of the CGA whether the device presented for application of a (qualified) certificate holds unique identification as SSCD, successfully proved this identity as SSCD to the CGA, and whether this identity is linked to the legitimate holder of the device as applicant for the certificate.

7.2.4 SSCD parts 5 and 6 only

OE.HID_TC_VAD_Exp

Trusted channel of HID for VAD export

The HID provides the human interface for user authentication. The HID will ensure confidentiality and integrity of the VAD as needed by the authentication method employed including export to the TOE by means of a trusted channel.

Application Note:

This security objective for the TOE is partly covering OE.HID_VAD from the core PPs (PP Part2 SSCD KG and PP Part3 SSCD KI). While OE.HID_VAD in the core PPs (PP Part2 SSCD KG and PP Part3 SSCD KI) requires only the operational environment to protect VAD, this ST requires the HID and the TOE to implement a trusted channel for the protection of the VAD: the HID exports the VAD and establishes one end of the trusted channel according to OE.HID_TC_VAD_Exp, the TOE imports VAD at the other end of the trusted channel according to OT.TOE_TC_VAD_Imp. Therefore this ST re-assigns partly the VAD protection from the operational environment as described by OE.HID_VAD to the TOE as described by OT.TOE_TC_VAD_Imp and leaves only the necessary functionality by the HID.

OE.SCA_TC_DTBS_Exp

Trusted channel of SCA for DTBS export

The SCA provides a trusted channel to the TOE for the protection of the integrity of the DTBS to ensure that the DTBS/R cannot be altered undetected in transit between the SCA and the TOE.

Application Note:

This security objective for the TOE is partly covering OE.DTBS_Protect from the core PPs (PP Part2 SSCD KG and PP Part3 SSCD KI). While OE.DTBS_Protect in the core PPs (PP Part2 SSCD KG and PP Part3 SSCD KI) requires only the operational environment to protect DTBS, this ST requires the SCA and the TOE to implement a trusted channel for the protection of the DTBS: the SCA exports the DTBS and establishes one end of the trusted channel according to OE.SCA_TC_DTBS_Exp, the TOE imports DTBS at the other end of the trusted channel according to OT.TOE_TC_DTBS_Imp. Therefore this ST re-assigns partly the DTBS protection from the operational environment as described by OE.DTBS_Protect to the TOE as described by OT.TOE_TC_DTBS_Imp and leaves only the necessary functionality by the SCA.

7.2.5 Security Objectives OE related to EAC2

OE.Chip_Auth_Key

Key Pairs needed for Chip Authentication and Restricted Identification

The electronic document issuer has to ensure that the electronic document’s chip authentication key pair and the Restricted Identification key pair are generated securely, that the private keys of these key pairs are stored correctly in the electronic document's chip, and that the corresponding public keys are distributed to the EAC2 terminals that are used according to [TR03110-2] to check the authenticity of the electronic document's chip. Justification: The TSF of [PACEPP] does not include any mechanism to verify the authenticity of an electronic document (i.e. protection against cloning). Therefore, this additional security objective for the operational environment does not mitigate any threat of, and does not fulfill any OSP of [PACEPP].

OE.Terminal_Authentication

AuthenticationKey pairs needed for Terminal Authentication

The electronic document issuer shall establish a public key infrastructure for the card verifiable certificates used for Terminal Authentication. For this aim, the electronic document issuer shall run a Country Verifying Certification Authority. The instances of the PKI shall fulfill the requirements and rules of the corresponding certificate policy. The electronic document issuer shall make the CVCA certificate available to the personalization agent or the manufacturer. Justification: The TSF of [PACEPP] does not include any mechanism to verify the authenticity of the terminal that reads out the data stored on the electronic document (by successfully executing PACE, a terminal only proves knowledge of the PACE password). Therefore, this additional security objective for the operational environment does not mitigate any threat of, and does not fulfill any OSP of [PACEPP].

OE.Legislative_Compliance

Issuing of the travel document

The travel document Issuer must issue the travel document and approve it using the terminals complying with all applicable laws and regulations.

OE.Passive_Auth_Sign

Authentication of travel document by Signature

The travel document Issuer has to establish the necessary public key infrastructure as follows: the CSCA acting on behalf and according to the policy of the travel document Issuer must (i) generate a cryptographically secure CSCA Key Pair, (ii) ensure the secrecy of the CSCA Private Key and sign Document Signer Certificates in a secure operational environment, and (iii) publish the Certificate of the CSCA Public Key (CCSCA). Hereby authenticity and integrity of these certificates are being maintained.A Document Signer acting in accordance with the CSCA policy must (i) generate a cryptographically secure Document Signing Key Pair, (ii) ensure the secrecy of the Document Signer Private Key, (iii) hand over the Document Signer Public Key to the CSCA for certification, (iv) sign Document Security Objects of genuine travel documents in a secure operational environment only. The digital signature in the Document Security Object relates to all hash values for each data group in use according to [6]. The Personalisation Agent has to ensure that the Document Security Object contains only the hash values of genuine user data according to [6]. The CSCA must issue its certificates exclusively to the rightful organisations (DS) and DSs must sign exclusively correct Document Security Objects to be stored on travel document.

OE.Personalisation

Personalisation of travel document

The travel document Issuer must ensure that the Personalisation Agents acting on his behalf (i) establish the correct identity of the travel document holder and create the biographical data for the travel document, (ii) enrol the biometric reference data of the travel document holder, (iii) write a subset of these data on the physical Passport (optical personalisation) and store them in the travel document (electronic personalisation) for the travel document holder as defined in [6]37, (iv) write the document details data, (v) write the initial TSF data, (vi) sign the Document Security Object defined in [6] (in the role of a DS).

OE.Terminal

Terminal operating

The terminal operators must operate their terminals as follows: 1)The related terminals (basic inspection systems, cf. above) are used by terminal operators and by travel document holders as defined in [6].

2)The related terminals implement the terminal parts of the PACE protocol [4], of the Passive Authentication [4] (by verification of the signature of the Document Security Object) and use them in this order38. The PACE terminal uses randomly and (almost)uniformly selected nonces, if required by the protocols (for generating ephemeral keys for Diffie-Hellmann).

3)The related terminals need not to use any own credentials.

4)The related terminals securely store the Country Signing Public Key and the Document Signer Public Key (in form of CCSCA and CDS) in order to enable and to perform Passive Authentication of the travel document (determination of the authenticity of data groups stored in the travel document, [6]).

5)The related terminals and their environment must ensure confidentiality and integrity of respective data handled by them (e.g. confidentiality of the PACE passwords, integrity of

PKI certificates, etc.), where it is necessary for a secure operation of the TOE according to the current PP.

OE.Travel_Document_Holder

Travel document holder Obligations

The travel document holder may reveal, if necessary, his or her verification values of the PACE password to an authorized person or device who definitely act according to respective regulations and are trustworthy.

7.3 Security Objectives Rationale

7.3.1 Threats

7.3.1.1 Threats related to EAC2

T.Counterfeit/EAC2 The threat T.Counterfeit/EAC2 addresses the attack of an unauthorized copy or reproduction of the genuine electronic document. This attack is countered by the proof of the chip's authenticity, as aimed by OT.CA2 using a Chip Authentication key pair that is generated within the issuing PKI branch, as aimed by OE.Chip_Auth_Key. According to OE.Chip_Auth_Key, the terminal has to perform the Chip Authentication 2 protocol to verify the authenticity of the electronic document's chip.

T.Sensitive_Data The threat T.Sensitive_Data is countered by the TOE-Objective OT.Sens_Data_EAC2, that requires that read access to sensitive user data is only granted to EAC2 terminals with corresponding access rights. Furthermore, it is required that the confidentiality of the data is ensured during transmission. The objective OE.Terminal_Authentication requires the electronic document issuer to provide the public key infrastructure (PKI) to generate and distribute the card verifiable certificates needed by the electronic document to securely authenticate the EAC2 terminal.

T.Abuse-Func The threat T.Abuse-Func addresses attacks of misusing TOE’s functionality to manipulate or to disclosure the stored User- or TSF-data as well as to disable or to bypass the soft-coded security functionality. The security objective OT.Prot_Abuse-Func ensures that the usage of functions having not to be used in the operational phase is effectively prevented.

T.Eavesdropping The threat T.Eavesdropping addresses listening to the communication between the TOE and a PACE terminal or an EAC2 terminal in order to gain access to transferred user data. This threat is countered by the security objective OT.Data_Confidentiality through a trusted channel based on PACE Authentication, and by OT.Sens_Data_EAC2 demanding a trusted channel that is based on Chip Authentication 2.

T.Forgery The threat T.Forgery addresses the fraudulent, complete or partial alteration of user data and/or TSF-Data stored on the TOE, and/or exchanged between the TOE and the terminal. The threat T.Forgery addresses the fraudulent, complete or partial alteration of the User Data or/and TSF-data stored on the TOE or/and exchanged between the TOE and the terminal. The security objective OT.AC_Pers requires the TOE to limit the write access for the travel document to the trustworthy Personalisation Agent (cf.

OE.Personalisation). The TOE will protect the integrity and authenticity of the stored and exchanged User Data or/and TSF-data as aimed by the security objectives OT.Data_Integrity and OT.Data_Authenticity, respectively. The objectives OT.Prot_Phys-Tamper and OT.Prot_Abuse-Func contribute to protecting integrity of the User Data or/and TSF-data stored on the TOE. A terminal operator operating his terminals according to OE.Terminal and performing the Passive Authentication using the Document Security Object as aimed by OE.Passive_Auth_Sign will be able to effectively verify integrity and authenticity of the data received from the TOE. The threat is also addressed by the refinement of OT.AC_Pers, here renamed OT.AC_Pers_EAC2.

T.Information_Leakage The threats T.Information_Leakage is typical for integrated circuits like smart cards under direct attack with high attack potential. The protection of the TOE against this threat is addressed by the directly related security objectives OT.Prot_Inf_Leak.

T.Malfunction The threats T.Malfunction is typical for integrated circuits like smart cards under direct attack with high attack potential. The protection of the TOE against this threat is addressed by the directly related security objectives OT.Prot_Malfunction.

T.Phys-Tamper The threats T.Phys-Tamper is typical for integrated circuits like smart cards under direct attack with high attack potential. The protection of the TOE against this threat is addressed by the directly related security objectives OT.Prot_Phys-Tamper.

T.Skimming The threat T.Skimming addresses accessing the user data (stored on the TOE or transferred between the TOE and the terminal) using the TOE's contactless/contact-based interface. This threat is countered by the security objectives OT.Data_Integrity, OT.Data_Authenticity and OT.Data_Confidentiality through the PACE authentication. The objective OE.Travel_Document_Holder ensures that a PACE session can only be established either by the travel document holder itself or by an authorised person or device, and, hence, cannot be captured by an attacker. Additionally, the threat is also addressed by OT.Sens_Data_EAC2 that demands a trusted channel based on Chip Authentication 2, and requires that read access to sensitive user data is only granted to EAC2 terminals with corresponding access rights. Moreover, OE.Terminal_Authentication requires the electronic document issuer to provide the corresponding PKI.

T.Tracing The threat T.Tracing addresses gathering TOE tracing data identifying it remotely by establishing or listening to a communication via the contactless/contact interface of the TOE, whereby the attacker does not a priori know the correct values of the PACE password. This threat is directly countered by security objectives OT.Tracing (no gathering TOE tracing data) and OE.Travel_Document_Holder (the attacker does not a priori know the correct values of the shared passwords).

7.3.1.2 Miscellaneous

T.SCD_Divulg addresses the threat against the legal validity of electronic signature due to storage and copying of SCD outside the TOE, as expressed in the directive [DIR], recital (18). This threat is countered by

- OE.SCD_Secrecy, which assures the secrecy of the SCD in the CSP environment, and

- OT.SCD_Secrecy, which assures the secrecy of the SCD during use by the TOE for signature creation.

Furthermore, generation and/or import of SCD known by an attacker is countered by OE.SCD/SVD_Auth_Gen, which ensures that only authorized SCD generation in the environment is possible, and OT.SCD_Auth_Imp, which ensures that only authorised SCD import is possible.

T.SCD_Derive deals with attacks on the SCD via public known data produced by the TOE, which are the SVD and the signatures created with the SCD. OT.SCD/SVD_Gen counters this threat by implementing cryptographically secure generation of the SCD/SVD pair. OT.Sig_Secure ensures cryptographically secure electronic signatures. OE.SCD_Unique counters this threat by implementing cryptographically secure generation of the SCD/SVD pair.

T.Hack_Phys deals with physical attacks exploiting physical vulnerabilities of the TOE. OT.SCD_Secrecy preserves the secrecy of the SCD. OT.EMSEC_Design counters physical attacks through the TOE interfaces and observation of TOE emanations. OT.Tamper_ID and OT.Tamper_Resistance counter the threat T.Hack_Phys by detecting and by resisting tampering attacks.

T.SVD_Forgery deals with the forgery of the SVD exported by the TOE to the CGA for certificate generation. T.SVD_Forgery is addressed by OT.SCD_SVD_Corresp, which ensures correspondence between SVD and SCD and unambiguous reference of the SVD/SCD pair for the SVD export and signature creation with the SCD, and OE.SVD_Auth that ensures the integrity of the SVD exported by the TOE to the CGA.

OE.SCD_SVD_Corresp, which ensures correspondence between SVD and SCD.

Additionally T.SVD_Forgery is addressed by OT.TOE_TC_SVD_Exp, which ensures that the TOE sends the SVD in a verifiable form through a trusted channel to the CGA, as well as by OE.CGA_TC_SVD_Imp, which provides verification of SVD authenticity by the CGA.

T.SigF_Misuse addresses the threat of misuse of the TOE signature creation function to create SDO by others than the signatory to create an electronic signature on data for which the signatory has not expressed the intent to sign, as required by paragraph 1(c) of Annex III [DIR]. OT.Lifecycle_Security (Lifecycle security) requires the TOE to detect flaws during the initialisation, personalisation and operational usage including secure destruction of the SCD, which may be initiated by the signatory. OT.Sigy_SigF (Signature creation function for the legitimate signatory only) ensures that the TOE provides the signature creation function for the legitimate signatory only. OE.DTBS_Intend (Data intended to be signed) ensures that the SCA sends the DTBS/R only for data the signatory intends to sign. OT.DTBS_Integrity_TOE (DTBS/R integrity inside the TOE) prevents the DTBS/R from alteration inside the TOE. OE.Signatory ensures that the signatory checks that an SCD stored in the SSCD when received from an SSCD-provisioning service provider is in non-operational state, i.e. the SCD cannot be used before the signatory becomes control over the SSCD. OE.Signatory ensures also that the signatory keeps their VAD confidential.

The combination of OT.TOE_TC_DTBS_Imp (Trusted channel of TOE for DTBS) and OE.SCA_TC_DTBS_Exp (Trusted channel of SCA for DTBS) counters the undetected manipulation of the DTBS during the transmission from the SCA to the TOE.

If the SCA provides a human interface for user authentication, OE.HID_TC_VAD_Exp (Trusted channel of HID for VAD) requires the HID to protect the confidentiality and the integrity of the VAD as needed by the authentication method employed. The HID and the TOE will protect the VAD by a trusted channel between HID and TOE according to OE.HID_TC_VAD_Exp (Trusted channel of HID for VAD) and OT.TOE_TC_VAD_Imp (Trusted channel of TOE for VAD).

T.DTBS_Forgery addresses the threat arising from modifications of the data sent as input to the TOE's signature creation function that does not represent the DTBS as presented to the signatory and for which the signature has expressed its intent to sign. The TOE IT environment addresses T.DTBS_Forgery by the means of OE.DTBS_Intend, which ensures that the trustworthy SCA generates the DTBS/R of the data that has been presented as DTBS and which the signatory intends to sign in a form appropriate for signing by the TOE. The TOE counters this threat by the means of OT.DTBS_Integrity_TOE by ensuring the integrity of the DTBS/R inside the TOE.

The threat T.DTBS_Forgery is addressed by the security objectives OT.TOE_TC_DTBS_Imp (Trusted channel of TOE for DTBS) and OE.SCA_TC_DTBS_Exp (Trusted channel of SCA for DTBS), which ensure that the DTBS/R is sent through a trusted channel and cannot be altered undetected in transit between the SCA and the TOE.

T.Sig_Forgery deals with non-detectable forgery of the electronic signature. OT.Sig_Secure, OT.SCD_Unique and OE.CGA_QCert address this threat in general. OT.Sig_Secure (Cryptographic security of the electronic signature) ensures by means of robust cryptographic techniques that the signed data and the electronic signature are securely linked together. OT.SCD_Unique ensures that the same SCD cannot be generated more than once and the corresponding SVD cannot be included in another certificate by chance. OE.CGA_QCert prevents forgery of the certificate for the corresponding SVD, which would result in false verification decision concerning a forged signature.

OE.SCD_Unique ensures that the same SCD cannot be generated more than once and the corresponding SVD cannot be included in another certificate by chance.

7.3.2 Organisational Security Policies

7.3.2.1 OSP related to EAC2

P.EAC2_Terminal The OSP P.EAC2_Terminal addresses the requirement for EAC2 terminals to implement the terminal parts of the protocols needed to executed EAC2 according to its specification in [TR03110-2], and to store (static keys) or generate (temporary keys and nonces) the needed related credentials. This is enforced by OE.Chip_Auth_Key which requires Chip Authentication and Restricted Identity keys to be correctly generated and stored, by OE.Terminal_Authentication for the PKI needed for Terminal Authentication, and by OE.Terminal which covers the PACE protocol and the Passive Authentication protocol.

P.Terminal_PKI The OSP P.Terminal_PKI is enforced by establishing the receiving PKI branch as aimed by the objective OE.Terminal_Authentication.

P.Card_PKI The OSP P.Card_PKI is enforced by establishing the issuing PKI branch as aimed by the objectives OE.Passive_Auth_Sign (for the Document Security Object).

P.Manufact The OSP P.Manufact "Manufacturing of the travel document's chip" requires a unique identification of the IC by means of the Initialization Data and the writing of the Pre-personalisation Data as being fulfilled by OT.Identification.

P.Pre-Operational The OSP P.Pre-Operational is enforced by the following security objectives:OT.Identification is affine to the OSP's property 'traceability before the operational phase';OT.AC_Pers and OE.Personalisation together enforce the OSP's properties 'correctness of the User- and the TSF-data stored' and 'authorisation of Personalisation Agents';OE.Legislative_Compliance is affine to the OSP's property 'compliance with laws and regulations'. In addition, the threat is also addressed by the refinement of OT.AC_Pers named OT.AC_Pers_EAC2.

P.Terminal The OSP P.Terminal is obviously enforced by the objective OE.Terminal, whereby the one-to-one mapping between the related properties is applicable.

P.Trustworthy_PKI The OSP P.Trustworthy_PKI is enforced by OE.Passive_Auth_Sign (for CSCA, issuing PKI branch).

7.3.2.2 Miscellaneous

P.CSP_QCert establishes the CSP generating qualified certificate or non-qualified certificate linking the signatory and the SVD implemented in the SSCD under sole control of this signatory. P.CSP_QCert is addressed by

- OT.Lifecycle_Security, which requires the TOE to detect flaws during the initialisation, personalisation and operational usage,
- OT.SCD_SVD_Corresp, which requires to ensure the correspondence between the SVD and the SCD during their generation,

- OE.SCD/SVD_Auth_Gen, which ensures that the SCD/SVD generation can be invoked by authorized users only,
- OT.SCD_Auth_Imp which ensures that authorised users only may invoke the import of the SCD,
- OE.SCD_SVD_Corresp, which requires the CSP to ensure the correspondence between the SVD and the SCD during their generation, and
- OE.CGA_QCert for generation of qualified certificates or non-qualified certificates, which requires the CGA to certify the SVD matching the SCD implemented in the TOE under sole control of the signatory.

According to OT.TOE_SSCD_Auth the copies of the TOE will hold unique identity and authentication data as SSCD and provide security mechanisms enabling the CGA to identify and to authenticate the TOE as SSCD to prove this identity as SSCD to the CGA. The OE.CGA_SSCD_Auth ensures that the SP checks the proof of the device presented of the applicant that it is a SSCD.

P.QSign provides that the TOE and the SCA may be employed to sign data with an advanced electronic signature, which is a qualified electronic signature if based on a valid qualified certificate. OT.Sigy_SigF ensures signatory's sole control of the SCD by requiring the TOE to provide the signature creation function for the legitimate signatory only and to protect the SCD against the use of others. OT.Sig_Secure ensures that the TOE creates electronic signatures, which cannot be forged without knowledge of the SCD through robust encryption techniques. OE.CGA_QCert addresses the requirement of qualified or non-qualified electronic certificates building a base for the electronic signature. OE.DTBS_Intend ensures that the SCA provides only those DTBS to the TOE, which the signatory intends to sign.

P.Sigy_SSCD requires the TOE to meet Annex III [DIR]. This is ensured as follows:

- OE.SCD_Unique meets the paragraph 1(a) of the directive [DIR], Annex III, by the requirements that the SCD used for signature creation can practically occur only once;
- OT.SCD_Unique meets the paragraph 1(a) of Annex III [DIR], by the requirements that the SCD used for signature creation can practically occur only once;
- OT.SCD_Unique, OT.SCD_Secrecy and OT.Sig_Secure meet the requirement in paragraph 1(a) of Annex III [DIR] by the requirements to ensure secrecy of the SCD.
- OT.EMSEC_Design and OT.Tamper_Resistance address specific objectives to ensure secrecy of the SCD against specific attacks;
- OT.SCD_Auth_Imp, which limits SCD import to authorised users only;
- OE.SCD_Secrecy, which ensures the confidentiality of the SCD during generation and export to the TOE, and deletes the SCD after export to the TOE. The CSP does not use the SCD for signature creation;
- OT.SCD_Secrecy and OT.Sig_Secure meet the requirement in paragraph 1(b) of Annex III [DIR] by the requiements to ensure that the SCD cannot be derived from SVD, the electronic signatures or any other data exported outside the TOE;
- OT.Sigy_SigF meets the requirement in paragraph 1(c) of Annex III [DIR] by the requirements to ensure that the TOE provides the signature creation

function for the legitimate signatory only and protects the SCD against the use of others;

- OT.DTBS_Integrity_TOE meets the requirements in paragraph 2 of Annex III [DIR] as the TOE must not alter the DTBS/R.

Paragraph 2 of Annex III [DIR], requires that an SSCD does not prevent the data to be signed from being presented to the signatory prior to the signature process is obviously fulfilled by the method of TOE usage: the SCA will present the DTBS to the signatory and send it to the SSCD for signing.

The usage of SCD under sole control of the signatory is ensured by

- OT.Lifecycle_Security requiring the TOE to detect flaws during the initialisation, personalisation and operational usage,
- OE.SCD/SVD_Auth_Gen, which limits invocation of the generation of the SCD and the SVD to authorised users only,
- OT.SCD/SVD_Gen, which limits invocation of the generation of the SCD and the SVD to authorised users only, and
- OT.Sigy_SigF, which requires the TOE to provide the signature creation function for the legitimate signatory only and to protect the SCD against the use of others.

OE.Dev_Prov_Service ensures that the legitimate user obtains a TOE sample as an authentic, initialised and personalised TOE from an SSCD Provisioning Service through the TOE delivery procedure. If the TOE implements SCD generated under control of the SSCD Provisioning Service the legitimate user receives the TOE as SSCD. If the TOE is delivered to the legitimate user without SCD In the operational phase he or she applies for the (qualified) certificate as the Device holder and legitimate user of the TOE. The CSP will use the TOE security feature (addressed by the security objectives OT.TOE_SSCD_Auth and OT.TOE_TC_SVD_Exp) to check whether the device presented is a SSCD linked to the applicant as required by OE.CGA_SSCD_Auth and the received SVD is sent by this SSCD as required by OE.CGA_TC_SVD_Imp. Thus the obligation of the SSCD provision service for the first SCD/SVD pair is complemented in an appropriate way by the CSP for the SCD/SVD pair generated outside the secure preparation environment.

P.Sig_Non-Repud deals with the repudiation of signed data by the signatory, although the electronic signature is successfully verified with the SVD contained in their certificate valid at the time of signature creation. This policy is implemented by the combination of the security objectives for the TOE and its operational environment, which ensures the aspects of signatory's sole control over and responsibility for the electronic signatures created with the TOE.

OE.SCD/SVD_Auth_Gen, OE.SCD_Secrecy and OE.SCD_Unique ensure the security of the SCD in the CSP environment. OE.SCD_Secrecy ensures the confidentiality of the SCD during generation, during and after export to the TOE. The CSP does not use the SCD for creation of any signature and deletes the SCD irreversibly after export to the TOE. OE.SCD_Unique provides that the signatory's SCD can practically occur just once. OE.SCD_SVD_Corresp ensures that the SVD in the certificate of the signatory corresponds to the SCD that is implemented in the copy of the TOE of the signatory. OE.CGA_QCert ensures that the certificate allows to identify the signatory and thus to link the SVD to the signatory. OE.SVD_Auth and OE.CGA_QCert require the environment to ensure authenticity of the SVD as being exported by the TOE and used under sole control of the signatory. OT.SCD_SVD_Corresp ensures that the SVD exported by the TOE corresponds to the SCD that is implemented in the TOE. OT.SCD_Unique provides that the signatory's

SCD can practically occur just once.OE.Signatory ensures that the signatory checks that the SCD, stored in the SSCD received from an SSCD provisioning service is in non-operational state (i.e. the SCD cannot be used before the signatory becomes into sole control over the SSCD). OT.Sigy_SigF provides that only the signatory may use the TOE for signature creation. As prerequisite OE.Signatory ensures that the signatory keeps their VAD confidential. OE.DTBS_Intend and OT.DTBS_Integrity_TOE ensure that the TOE creates electronic signatures only for those DTBS/R, which the signatory has decided to sign as DTBS. The robust cryptographic techniques required by OT.Sig_Secure ensure that only this SCD may create a valid electronic signature that can be successfully verified with the corresponding SVD used for signature verification. The security objective for the TOE OT.Lifecycle_Security (Lifecycle security), OT.SCD_Secrecy (Secrecy of the signature creation data), OT.EMSEC_Design (Provide physical emanations security), OT.Tamper_ID (Tamper detection) and OT.Tamper_Resistance (Tamper resistance) protect the SCD against any compromise.

The TOE security feature addressed by the security objectives OT.TOE_SSCD_Auth and OT.TOE_TC_SVD_Exp supported by OE.Dev_Prov_Service enables the verification whether the device presented by the applicant is a SSCD as required by OE.CGA_SSCD_Auth and the received SVD is sent by the device holding the corresponding SCD as required by OE.CGA_TC_SVD_Imp.

The confidentiality of VAD is protected during the transmission between the HI device and TOE according to OE.HID_TC_VAD_Exp (Trusted channel of HID for VAD) and OT.TOE_TC_VAD_Imp (Trusted channel of TOE for VAD). OE.DTBS_Intend (SCA sends data intended to be signed), OT.DTBS_Integrity_TOE (DTBS/R integrity inside the TOE), OE.SCA_TC_DTBS_Exp (Trusted channel of SCA for DTBS) and OT.TOE_TC_DTBS_Imp (Trusted channel of TOE for DTBS) ensure that the TOE generates electronic signatures only for a DTBS/R that the signatory has decided to sign as DTBS.

7.3.3 Assumptions

7.3.3.1 All SSCD parts

A.CGA establishes the protection of the authenticity of the signatory's name and the SVD in the qualified certificate by the advanced signature of the CSP by means of the CGA. This is addressed by OE.CGA_QCert (Generation of qualified certificates), which ensures the generation of qualified certificates, and by OE.SVD_Auth (Authenticity of the SVD), which ensures the protection of the integrity of the received SVD and the verification of the correspondence between the SVD and the SCD that is implemented by the SSCD of the signatory.

A.SCA establishes the trustworthiness of the SCA with respect to generation of DTBS/R. This is addressed by OE.DTBS_Intend (Data intended to be signed) which ensures that the SCA generates the DTBS/R of the data that have been presented to the signatory as DTBS and which the signatory intends to sign in a form which is appropriate for being signed by the TOE.

7.3.3.2 Parts 3 and 6 only

A.CSP establishes several security aspects concerning handling of SCD and SVD by the CSP. That the SCD/SVD generation device can only be used by authorized users is addressed by OE.SCD/SVD_Auth_Gen (Authorized SCD/SVD Generation), that the generated SCD is unique and cannot be derived by the SVD is addressed by OE.SCD_Unique (Uniqueness of the signature creation data), that SCD and SVD correspond to each other is addressed by OE.SCD_SVD_Corresp (Correspondence between SVD and SCD), and that the SCD are kept confidential, are not used for signature generation in the environment and are deleted in the environment once exported to the TOE is addressed by OE.SCD_Secrecy (SCD Secrecy).

7.3.4 *SPD and Security Objectives*

Threats	Security Objectives	Rationale
T.Counterfeit/EAC2	OT.CA2, OE.Chip_Auth_Key	Section 7.3.1
T.Sensitive_Data	OT.Sens_Data_EAC2, OE.Terminal_Authentication	Section 7.3.1
T.Abuse-Func	OT.Prot_Abuse-Func	Section 7.3.1
T.Eavesdropping	OT.Data_Confidentiality, OT.Sens_Data_EAC2	Section 7.3.1
T.Forgery	OT.AC_Pers_EAC2, OT.Data_Authenticity, OT.Data_Integrity, OT.Prot_Abuse-Func, OT.Prot_Phys-Tamper, OE.Personalisation, OE.Passive_Auth_Sign, OE.Terminal	Section 7.3.1
T.Information_Leakage	OT.Prot_Inf_Leak	Section 7.3.1
T.Malfunction	OT.Prot_Malfunction	Section 7.3.1
T.Phys-Tamper	OT.Prot_Phys-Tamper	Section 7.3.1
T.Skimming	OT.Data_Integrity, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Sens_Data_EAC2, OE.Terminal_Authentication, OE.Travel_Document_Holder	Section 7.3.1
T.Tracing	OT.Tracing, OE.Travel_Document_Holder	Section 7.3.1
T.SCD_Divulg	OT.SCD_Secrecy, OT.SCD_Auth_Imp, OE.SCD/SVD_Auth_Gen, OE.SCD_Secrecy	Section 7.3.1
T.SCD_Derive	OT.SCD/SVD_Gen, OT.Sig_Secure, OE.SCD_Unique	Section 7.3.1
T.Hack_Phys	OT.SCD_Secrecy, OT.EMSEC_Design, OT.Tamper_ID, OT.Tamper_Resistance	Section 7.3.1
T.SVD_Forgery	OT.SCD_SVD_Corresp, OE.SVD_Auth, OE.SCD_SVD_Corresp, OT.TOE_TC_SVD_Exp, OE.CGA_TC_SVD_Imp	Section 7.3.1
T.SigF_Misuse	OT.Lifecycle_Security, OT.Sigy_SigF, OT.DTBS_Integrity_TOE, OE.Signatory, OE.DTBS_Intend, OT.TOE_TC_VAD_Imp,	Section 7.3.1

	OT.TOE_TC_DTBS_Imp, OE.HID_TC_VAD_Exp, OE.SCA_TC_DTBS_Exp	
T.DTBS_Forgery	OT.DTBS_Integrity_TOE, OE.DTBS_Intend, OT.TOE_TC_DTBS_Imp, OE.SCA_TC_DTBS_Exp	Section 7.3.1
T.Sig_Forgery	OT.SCD_Unique, OT.Sig_Secure, OE.CGA_QCert, OE.SCD_Unique	Section 7.3.1

Table 4 Threats and Security Objectives - Coverage

Security Objectives	Threats	Rationale
OT.Tamper_Resistance	T.Hack_Phys	
OT.Tamper_ID	T.Hack_Phys	
OT.EMSEC_Design	T.Hack_Phys	
OT.DTBS_Integrity_TOE	T.SigF_Misuse, T.DTBS_Forgery	
OT.Sigy_SigF	T.SigF_Misuse	
OT.Sig_Secure	T.SCD_Derive, T.Sig_Forgery	
OT.SCD_Secrecy	T.SCD_Divulg, T.Hack_Phys	
OT.Lifecycle_Security	T.SigF_Misuse	
OT.SCD_SVD_Corresp	T.SVD_Forgery	
OT.SCD_Unique	T.Sig_Forgery	
OT.SCD/SVD_Gen	T.SCD_Derive	
OT.SCD_Auth_Imp	T.SCD_Divulg	
OT.TOE_SSCD_Auth		
OT.TOE_TC_SVD_Exp	T.SVD_Forgery	
OT.TOE_TC_VAD_Imp	T.SigF_Misuse	
OT.TOE_TC_DTBS_Imp	T.SigF_Misuse, T.DTBS_Forgery	
OT.AC_Pers_EAC2	T.Forgery	
OT.CA2	T.Counterfeit/EAC2	
OT.Sens_Data_EAC2	T.Sensitive_Data, T.Eavesdropping, T.Skimming	
OT.Data_Authenticity	T.Forgery, T.Skimming	
OT.Data_Confidentiality	T.Eavesdropping, T.Skimming	
OT.Data_Integrity	T.Forgery, T.Skimming	
OT.Identification		
OT.Prot_Abuse-Func	T.Abuse-Func, T.Forgery	
OT.Prot_Inf_Leak	T.Information_Leakage	
OT.Prot_Malfunction	T.Malfunction	

OT.Prot_Phys-Tamper	T.Forgery, T.Phys-Tamper	
OT.Tracing	T.Tracing	
OE.Signatory	T.SigF_Misuse	
OE.DTBS_Intend	T.SigF_Misuse, T.DTBS_Forgery	
OE.SVD_Auth	T.SVD_Forgery	
OE.CGA_QCert	T.Sig_Forgery	
OE.SCD_SVD_Corresp	T.SVD_Forgery	
OE.SCD_Unique	T.SCD_Derive, T.Sig_Forgery	
OE.SCD_Secrecy	T.SCD_Divulg	
OE.SCD/SVD_Auth_Gen	T.SCD_Divulg	
OE.Dev_Prov_Service		
OE.CGA_TC_SVD_Imp	T.SVD_Forgery	
OE.CGA_SSCD_Auth		
OE.HID_TC_VAD_Exp	T.SigF_Misuse	
OE.SCA_TC_DTBS_Exp	T.SigF_Misuse, T.DTBS_Forgery	
OE.Chip_Auth_Key	T.Counterfeit/EAC2	
OE.Terminal_Authentication	T.Sensitive_Data, T.Skimming	
OE.Legislative_Compliance		
OE.Passive_Auth_Sign	T.Forgery	
OE.Personalisation	T.Forgery	
OE.Terminal	T.Forgery	
OE.Travel_Document_Holder	T.Skimming, T.Tracing	

Table 5 Security Objectives and Threats - Coverage

Organisational Security Policies	Security Objectives	Rationale
P.EAC2_Terminal	OE.Terminal, OE.Chip_Auth_Key, OE.Terminal_Authentication	Section 7.3.2
P.Terminal_PKI	OE.Terminal_Authentication	Section 7.3.2
P.Card_PKI	OE.Passive_Auth_Sign	Section 7.3.2
P.Manufact	OT.Identification	Section 7.3.2
P.Pre-Operational	OT.Identification, OT.AC_Pers_EAC2, OE.Personalisation, OE.Legislative_Compliance	Section 7.3.2
P.Terminal	OE.Terminal	Section 7.3.2
P.Trustworthy_PKI	OE.Passive_Auth_Sign	Section 7.3.2

P.CSP_QCert	OT.Lifecycle_Security, OT.SCD_SVD_Corresp, OE.CGA_QCert, OT.SCD_Auth_Imp, OE.SCD/SVD_Auth_Gen, OE.SCD_SVD_Corresp, OT.TOE_SSCD_Auth, OE.CGA_SSCD_Auth	Section 7.3.2
P.QSign	OT.Sig_Secure, OT.Sigy_SigF, OE.CGA_QCert, OE.DTBS_Intend	Section 7.3.2
P.Sigy_SSCD	OT.Lifecycle_Security, OT.SCD/SVD_Gen, OT.SCD_Unique, OT.SCD_Secrecy, OT.Sig_Secure, OT.Sigy_SigF, OT.DTBS_Integrity_TOE, OT.EMSEC_Design, OT.Tamper_Resistance, OT.SCD_Auth_Imp, OE.SCD/SVD_Auth_Gen, OE.SCD_Secrecy, OE.SCD_Unique, OT.TOE_SSCD_Auth, OT.TOE_TC_SVD_Exp, OE.Dev_Prov_Service, OE.CGA_TC_SVD_Imp, OE.CGA_SSCD_Auth	Section 7.3.2
P.Sig_Non-Repud	OT.Lifecycle_Security, OT.SCD_Unique, OT.SCD_SVD_Corresp, OT.SCD_Secrecy, OT.Sig_Secure, OT.Sigy_SigF, OT.DTBS_Integrity_TOE, OT.EMSEC_Design, OT.Tamper_ID, OT.Tamper_Resistance, OE.CGA_QCert, OE.SVD_Auth, OE.DTBS_Intend, OE.Signatory, OE.SCD/SVD_Auth_Gen, OE.SCD_Secrecy, OE.SCD_Unique, OE.SCD_SVD_Corresp, OT.TOE_SSCD_Auth, OT.TOE_TC_SVD_Exp, OE.Dev_Prov_Service, OE.CGA_TC_SVD_Imp, OE.CGA_SSCD_Auth, OT.TOE_TC_VAD_Imp, OT.TOE_TC_DTBS_Imp, OE.HID_TC_VAD_Exp, OE.SCA_TC_DTBS_Exp	Section 7.3.2

Table 6 OSPs and Security Objectives - Coverage

Security Objectives	Organisational Security Policies	Rationale
OT.Tamper_Resistance	P.Sigy_SSCD, P.Sig_Non-Repud	
OT.Tamper_ID	P.Sig_Non-Repud	
OT.EMSEC_Design	P.Sigy_SSCD, P.Sig_Non-Repud	
OT.DTBS_Integrity_TOE	P.Sigy_SSCD, P.Sig_Non-Repud	
OT.Sigy_SigF	P.QSign, P.Sigy_SSCD, P.Sig_Non-Repud	
OT.Sig_Secure	P.QSign, P.Sigy_SSCD, P.Sig_Non-Repud	
OT.SCD_Secrecy	P.Sigy_SSCD, P.Sig_Non-Repud	
OT.Lifecycle_Security	P.CSP_QCert, P.Sigy_SSCD, P.Sig_Non-Repud	
OT.SCD_SVD_Corresp	P.CSP_QCert, P.Sig_Non-Repud	
OT.SCD_Unique	P.Sigy_SSCD, P.Sig_Non-Repud	
OT.SCD/SVD_Gen	P.Sigy_SSCD	

OT.SCD_Auth_Imp	P.CSP_QCert, P.Sigy_SSCD	
OT.TOE_SSCD_Auth	P.CSP_QCert, P.Sigy_SSCD, P.Sig_Non-Repud	
OT.TOE_TC_SVD_Exp	P.Sigy_SSCD, P.Sig_Non-Repud	
OT.TOE_TC_VAD_Imp	P.Sig_Non-Repud	
OT.TOE_TC_DTBS_Imp	P.Sig_Non-Repud	
OT.AC_Pers_EAC2	P.Pre-Operational	
OT.CA2		
OT.Sens_Data_EAC2		
OT.Data_Authenticity		
OT.Data_Confidentiality		
OT.Data_Integrity		
OT.Identification	P.Manufact, P.Pre-Operational	
OT.Prot_Abuse-Func		
OT.Prot_Inf_Leak		
OT.Prot_Malfunction		
OT.Prot_Phys-Tamper		
OT.Tracing		
OE.Signatory	P.Sig_Non-Repud	
OE.DTBS_Intend	P.QSign, P.Sig_Non-Repud	
OE.SVD_Auth	P.Sig_Non-Repud	
OE.CGA_QCert	P.CSP_QCert, P.QSign, P.Sig_Non-Repud	
OE.SCD_SVD_Corresp	P.CSP_QCert, P.Sig_Non-Repud	
OE.SCD_Unique	P.Sigy_SSCD, P.Sig_Non-Repud	
OE.SCD_Secrecy	P.Sigy_SSCD, P.Sig_Non-Repud	
OE.SCD/SVD_Auth_Gen	P.CSP_QCert, P.Sigy_SSCD, P.Sig_Non-Repud	
OE.Dev_Prov_Service	P.Sigy_SSCD, P.Sig_Non-Repud	
OE.CGA_TC_SVD_Imp	P.Sigy_SSCD, P.Sig_Non-Repud	
OE.CGA_SSCD_Auth	P.CSP_QCert, P.Sigy_SSCD, P.Sig_Non-Repud	
OE.HID_TC_VAD_Exp	P.Sig_Non-Repud	
OE.SCA_TC_DTBS_Exp	P.Sig_Non-Repud	
OE.Chip_Auth_Key	P.EAC2_Terminal	
OE.Terminal_Authentication	P.EAC2_Terminal, P.Terminal_PKI	
OE.Legislative_Compliance	P.Pre-Operational	
OE.Passive_Auth_Sign	P.Card_PKI, P.Trustworthy_PKI	

OE.Personalisation	P.Pre-Operational	
OE.Terminal	P.EAC2_Terminal, P.Terminal	
OE.Travel_Document_Holder		

Table 7 Security Objectives and OSPs - Coverage

Assumptions	Security Objectives for the Operational Environment	Rationale
A.CGA	OE.CGA_QCert, OE.SVD_Auth	Section 7.3.3
A.SCA	OE.DTBS_Intend	Section 7.3.3
A.CSP	OE.SCD/SVD_Auth_Gen, OE.SCD_Secrecy, OE.SCD_Unique, OE.SCD_SVD_Corresp	Section 7.3.3

Table 8 Assumptions and Security Objectives for the Operational Environment - Coverage

Security Objectives for the Operational Environment	Assumptions	Rationale
OE.Signatory		
OE.DTBS_Intend	A.SCA	
OE.SVD_Auth	A.CGA	
OE.CGA_QCert	A.CGA	
OE.SCD_SVD_Corresp	A.CSP	
OE.SCD_Unique	A.CSP	
OE.SCD_Secrecy	A.CSP	
OE.SCD/SVD_Auth_Gen	A.CSP	
OE.Dev_Prov_Service		
OE.CGA_TC_SVD_Imp		
OE.CGA_SSCD_Auth		
OE.HID_TC_VAD_Exp		
OE.SCA_TC_DTBS_Exp		
OE.Chip_Auth_Key		
OE.Terminal_Authentication		
OE.Legislative_Compliance		
OE.Passive_Auth_Sign		
OE.Personalisation		
OE.Terminal		
OE.Travel_Document_Holder		

Table 9 Security Objectives for the Operational Environment and Assumptions - Coverage

8 Extended Requirements

8.1 Extended Family FPT_EMS - TOE Emanation

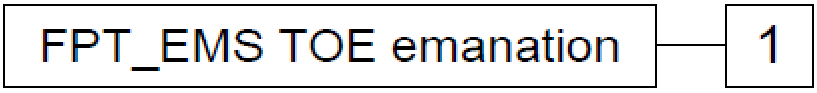
The additional family FPT_EMS (TOE Emanation) of the Class FPT (Protection of the TSF) is defined here to describe the IT security functional requirements of the TOE. The TOE shall prevent attacks against the SCD and other secret data where the attack is based on external observable physical phenomena of the TOE. Examples of such attacks are evaluation of TOE's electromagnetic radiation, simple power analysis (SPA), differential power analysis (DPA), timing attacks, radio emanation etc. This family describes the functional requirements for the limitation of intelligible emanations. The family FPT_EMS belongs to the Class FPT because it is the class for TSF protection. Other families within the Class FPT do not cover the TOE emanation.

The family "TOE Emanation (FPT_EMS)" is specified as follows:

Family behavior:

This family defines requirements to mitigate intelligible emanations.

Component leveling:



FPT_EMS.1 TOE emanation has two constituents:

FPT_EMS.1.1 Limit of Emissions requires to not emit intelligible emissions enabling access to TSF data or user data.

FPT_EMS.1.2 Interface Emanation requires to not emit interface emanation enabling access to TSF data or user data.

Management: FPT_EMS.1
There are no management activities foreseen.

Audit: FPT_EMS.1
There are no actions defined to be auditable if FAU_GEN (Security audit data generation) is included in a PP or ST using FPT_EMS.1.

FPT_EMS.1 TOE Emanation

Hierarchical to: No other components.

Dependencies: No dependencies.

FPT_EMS.1.1 The TOE shall not emit [assignment: types of emissions] in excess of [assignment: specified limits] enabling access to [assignment: list of types of TSF data] and [assignment: list of types of user data].

FPT_EMS.1.2 The TSF shall ensure [assignment: type of users] are unable to use the following interface [assignment: type of connection] to gain access to [assignment: list of types of TSF data] and [assignment: list of types of user data].

8.2 Extended Family FIA_API - Authentication Proof of Identity

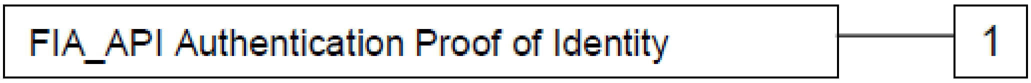
To describe the IT security functional requirements of the TOE a sensitive family (FIA_API) of the Class FIA (Identification and authentication) is defined here. This family describes the functional requirements for the proof of the claimed identity for the authentication verification by an external entity where the other families of the class FIA address the verification of the identity of an external entity.

The family "Authentication Proof of Identity (FIA_API)" is specified as follows:

Family behavior:

This family defines functions provided by the TOE to prove their identity and to be verified by an external entity in the TOE IT environment.

Component levelling:



FIA_API.1 Authentication Proof of Identity.

Management: FIA_API.1

The following actions could be considered for the management functions in FMT: Management of authentication information used to prove the claimed identity.

Audit: There are no actions defined to be auditable.

FIA_API.1 Authentication Proof of Identity

Hierarchical to: No other components.

Dependencies: No dependencies.

FIA_API.1.1 The TSF shall provide a [assignment: authentication mechanism] to prove the identity of the [assignment: authorized user or role].

8.3 Extended Family FCS_RND - Generation of random numbers

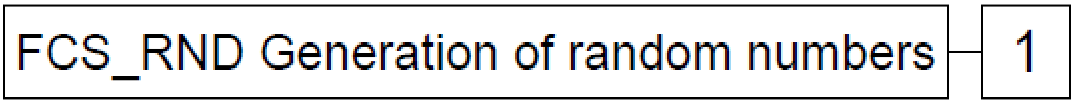
To describe the IT security functional requirements of the TOE, the family FCS_RND of the class FCS (Cryptographic support) is defined here. This family describes the functional requirements for random number generation used for cryptographic purposes. The component FCS_RND.1 is not limited to generation of cryptographic keys unlike the component FCS_CKM.1. The similar component FIA_SOS.2 is intended for non-cryptographic use.

The family "Generation of random numbers (FCS_RND)" is specified as follows:

Family behavior:

This family defines quality requirements for the generation of random numbers which are intended to be used for cryptographic purposes.

Component leveling:



FCS_RND.1 Generation of random numbers requires that random numbers meet a defined quality metric.

Management: FCS_RND.1
There are no management activities foreseen.

Audit: FCS_RND.1
There are no actions defined to be auditable.

FCS_RND.1 Quality Metric for Random Numbers

Hierarchical to: No other components.

Dependencies: No dependencies.

FCS_RND.1.1 The TSF shall provide a mechanism to generate random numbers that meet [assignment: a defined quality metric].

8.4 Extended Family FMT_LIM - Limited capabilities

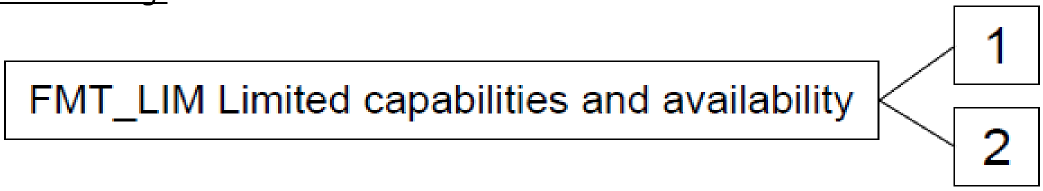
The family FMT_LIM describes the functional requirements for the test features of the TOE. The new functional requirements were defined in the class FMT because this class addresses the management of functions of the TSF. The examples of the technical mechanism used in the TOE show that no other class is appropriate to address the specific issues of preventing abuse of functions by limiting the capabilities of the functions and by limiting their availability.

The family "Limited capabilities and availability (FMT_LIM)" is specified as follows:

Family behavior:

This family defines requirements that limit the capabilities and availability of functions in a combined manner. Note that FDP_ACF restricts the access to functions whereas the Limited capability of this family requires the functions themselves to be designed in a specific manner.

Component leveling:



FMT_LIM.1 Limited capabilities requires that the TSF is built to provide only the capabilities (perform action, gather information) necessary for its genuine purpose.

FMT_LIM.2 Limited availability requires that the TSF restrict the use of functions (refer to Limited capabilities (FMT_LIM.1)). This can be achieved, for instance, by removing or by disabling functions in a specific phase of the TOE's lifecycle.

Management: FMT_LIM.1, FMT_LIM.2
There are no management activities foreseen.

Audit: FMT_LIM.1, FMT_LIM.2
There are no actions defined to be auditable.

FMT_LIM.1 Limited Capabilities

Hierarchical to: No other components.

Dependencies: FMT_LIM.2 Limited availability.

FMT_LIM.1.1 The TSF shall be designed in a manner that limits their capabilities so that in conjunction with “Limited availability (FMT_LIM.2)” the following policy is enforced [assignment: Limited capability and availability policy].

FMT_LIM.2 Limited Availability

Hierarchical to: No other components.

Dependencies: FMT_LIM.1 Limited capabilities.

FMT_LIM.2.1 The TSF shall be designed in a manner that limits their availability so that in conjunction with ”Limited capabilities (FMT_LIM.1)” the following policy is enforced [assignment: Limited capability and availability policy].

9 Security Requirements

9.1 Security Functional Requirements

This section describes the requirements imposed on the TOE in order to achieve the security objectives laid down in the previous chapter.

9.1.1 All SSCD parts

9.1.1.1 Protection of the TSF (FPT)

FPT_EMS.1 TOE Emanation

FPT_EMS.1.1 The TOE shall not emit **side channel** in excess of **state of the art** enabling access to **SCD** and **RAD**

- **the session keys (PACE-KMAC, PACE-KEnc), (CA-KMAC, CA-KEnc),**
- **the ephemeral private key ephem - SKPICC- PACE,**
- **the Chip Authentication private keys (SKPICC)**
- **the PIN, PUK**.

FPT_EMS.1.2 The TSF shall ensure **that unauthorized users** are unable to use the following interface **external circuit contacts** to gain access to **RAD** and **SCD**

- **the session keys (PACE-KMAC, PACE-KEnc), (CA-KMAC, CA-KEnc),**
- **the ephemeral private key ephem - SKPICC- PACE1,**
- **the Chip Authentication private key(s) (SKPICC),**
- **the PIN, PUK**.

Application Note:

The TOE shall prevent attacks against the SCD and other secret data where the attack is based on external observable physical phenomena of the TOE. Such attacks may be observable at the interfaces of the TOE or may origin from internal operation of the TOE or may origin by an attacker that varies the physical environment under which the TOE operates. The set of measurable physical phenomena is influenced by the technology employed to implement the TOE. Examples of measurable phenomena are variations in the power consumption, the timing of transitions of internal states, electromagnetic radiation due to internal operation, radio emission.

Due to the heterogeneous nature of the technologies that may cause such emanations, evaluation against state-of-the-art attacks applicable to the technologies employed by the TOE is assumed. Examples of such attacks are, but are not limited to, evaluation of TOE's electromagnetic radiation, simple power analysis (SPA), differential power analysis (DPA), timing attacks, etc.

FPT_FLS.1 Failure with preservation of secure state

FPT_FLS.1.1 The TSF shall preserve a secure state when the following types of failures occur:

- **(1) self-test according to FPT_TST fails**
- **(2) power shortage**
- **(3) over and under voltage**
- **(4) over and under clock frequency**
- **(5) over and under temperature**
- **(6) integrity problems**
- **(7) unexpected abortion of the execution of the TSF due to external events**
- **No other failure**.

FPT_PHP.1 Passive detection of physical attack

FPT_PHP.1.1 The TSF shall provide unambiguous detection of physical tampering that might compromise the TSF.

FPT_PHP.1.2 The TSF shall provide the capability to determine whether physical tampering with the TSF's devices or TSF's elements has occurred.

FPT_PHP.3 Resistance to physical attack

FPT_PHP.3.1 The TSF shall resist **physical manipulation and physical probing** to the **TSF** by responding automatically such that the SFRs are always enforced.

FPT_TST.1 TSF testing

FPT_TST.1.1 The TSF shall run a suite of self tests **during initial start-up and periodically during normal operation** to demonstrate the correct operation of **the TSF**.

FPT_TST.1.2 The TSF shall provide authorised users with the capability to verify the integrity of **TSF data**.

FPT_TST.1.3 The TSF shall provide authorised users with the capability to verify the integrity of **TSF**.

9.1.1.2 Security management (FMT)

FMT_SMR.1 Security roles

FMT_SMR.1.1 The TSF shall maintain the roles **R.Admin and R.Sigy**.

FMT_SMR.1.2 The TSF shall be able to associate users with roles.

FMT_SMF.1 Specification of Management Functions

FMT_SMF.1.1 The TSF shall be capable of performing the following management functions:

- **Creation and modification of RAD,**
- **Enabling the signature creation function,**
- **Modification of the security attribute SCD/SVD management, SCD operational,**
- **Change the default value of the security attribute SCD Identifier,**
- **Initialization,**
- **Pre-Personalization,**
- **Personalization,**
- **Configuration,**
- **Resume and unblock the PIN and PUK (if any),**.

FMT_MOF.1 Management of security functions behaviour

FMT_MOF.1.1 The TSF shall restrict the ability to **enable** the functions **signature creation function** to **R.Sigy**.

FMT_MSA.1/Admin Management of security attributes

FMT_MSA.1.1/Admin The TSF shall enforce the **SCD/SVD Generation SFP and SCD Import SFP** to restrict the ability to **modify** the security attributes **SCD/SVD management** to **R.Admin**.

FMT_MSA.1/Signatory Management of security attributes

FMT_MSA.1.1/Signatory The TSF shall enforce the **Signature Creation SFP** to restrict the ability to **modify** the security attributes **SCD operational** to **R.Sigy**.

FMT_MSA.2 Secure security attributes

FMT_MSA.2.1 The TSF shall ensure that only secure values are accepted for **SCD/SVD Management and SCD operational**.

FMT_MSA.3 Static attribute initialisation

FMT_MSA.3.1 The TSF shall enforce the **SCD/SVD Generation SFP, SVD Transfer SFP, SCD Import SFP and Signature Creation SFP** to provide **restrictive** default values for security attributes that are used to enforce the SFP.

FMT_MSA.3.2 The TSF shall allow the **R.Admin** to specify alternative initial values to override the default values when an object or information is created.

FMT_MSA.4 Security attribute value inheritance

FMT_MSA.4.1 The TSF shall use the following rules to set the value of security attributes:

- **(1) If S.Admin successfully generates an SCD/SVD pair without S.Sigy being authenticated the security attribute "SCD operational of the SCD" shall be set to "no" as a single operation**
- **(2) If S.Sigy successfully generates an SCD/SVD pair the security attribute "SCD operational of the SCD" shall be set to "yes" as a single operation**
- **(3) If S.Admin imports SCD while S.Sigy is not currently authenticated, the security attribute "SCD operational" of the SCD shall be set to "no" after import of the SCD as a single operation.**
- **(4) If S.Admin imports SCD while S.Sigy is currently authenticated, the security attribute "SCD operational" of the SCD shall be set to "yes" after import of the SCD as a single operation**

FMT_MTD.1/Admin Management of TSF data

FMT_MTD.1.1/Admin [Editorially Refined] The TSF shall restrict the ability to **create** the **RAD** to **R.Admin**.

FMT_MTD.1/Signatory Management of TSF data

FMT_MTD.1.1/Signatory The TSF shall restrict the ability to **modify** the **RAD** to **R.Sigy**.

9.1.1.3 Identification and authentication (FIA)

FIA_UID.1 Timing of identification

FIA_UID.1.1 The TSF shall allow

- **Self-test according to FPT_TST.1,**
- **Read EF.CardAccess,**
- **Execute Authentication Procedure,**
- **Select File,**
- **Verification of the RAD**
- **Establishing a trusted channel between a trusted IT product generating the SCD/SVD pair for import of the SCD as described by FDP_UCT.1/SCD and FDP_ITC.1/SCD and the TOE by means of TSF required by FTP_ITC.1/SCD (not applicable for SSCD KG).**
- **Establishing a trusted channel between the CGA and the TOE by means of TSF required by FTP_ITC.1/SVD to export the SVD to the CGA ([PP-SSCD4]).**
- **Establishing a trusted channel between the HID and the TOE by means of TSF required by FTP_ITC.1/VAD to send the VAD ([PP-SSCD5], [PP-SSCD6]).**
- **Establishing a trusted channel between the SCA and the TOE by means of TSF required by FTP_ITC.1/DTBS to send the DTBS ([PP-SSCD5], [PP-SSCD6])**

on behalf of the user to be performed before the user is identified.

FIA_UID.1.2 The TSF shall require each user to be successfully identified before allowing any other TSF-mediated actions on behalf of that user.

FIA_AFL.1 Authentication failure handling

FIA_AFL.1.1 The TSF shall detect when **an administrator configurable positive integer within 1 byte [0-255]** unsuccessful authentication attempts occur related to **consecutive failed authentication attempts**.

FIA_AFL.1.2 When the defined number of unsuccessful authentication attempts has been **met**, the TSF shall

- **Block the PIN**
- **Block the PUK**
- **When the RAD is blocked, any new authentication attempt fails**.

FIA_UAU.1 Timing of authentication

FIA_UAU.1.1 The TSF shall allow

- **Self-test according to FPT_TST.1,**
- **Identification of the user by means of TSF required by FIA_UID.1**
- **Read EF.CardAccess,**
- **Execute Authentication Procedure,**
- **Select File,**
- **Verification of the RAD**
- **Establishing a trusted channel between a trusted IT product generating the SCD/SVD pair for import the SCD as described by FDP_UCT.1/SCD and FDP_ITC.1/SCD and the TOE by means of TSF required by FTP_ITC.1/SCD (not applicable for SSCD KG).**
- **Establishing a trusted channel between the CGA and the TOE by means of TSF required by FTP_ITC.1/SVD to export the SVD to the CGA ([PP-SSCD4]).**
- **Establishing a trusted channel between the HID and the TOE by means of TSF required by FTP_ITC.1/VAD to send the VAD ([PP-SSCD5], [PP-SSCD6]).**
- **Establishing a trusted channel between the SCA and the TOE by means of TSF required by FTP_ITC.1/DTBS to send the DTBS ([PP-SSCD5], [PP-SSCD6])**

on behalf of the user to be performed before the user is authenticated.

FIA_UAU.1.2 The TSF shall require each user to be successfully authenticated before allowing any other TSF-mediated actions on behalf of that user.

9.1.1.4 User data protection (FDP)

The security attributes and related status for the subjects and objects are:

Subject or object the security attribute is associated with	Security attribute type	Value of the security attribute
S.User	Role	R.Admin, R.Sigy
S.User	SCD/SVD Management	authorised, not authorised
SCD	SCD Operational	no, yes
SCD	SCD identifier	arbitrary value

FDP_SDI.2/DTBS Stored data integrity monitoring and action

FDP_SDI.2.1/DTBS The TSF shall monitor user data stored in containers controlled by the TSF for **integrity error** on all objects, based on the following attributes: **integrity checked stored DTBS**.

FDP_SDI.2.2/DTBS Upon detection of a data integrity error, the TSF shall

- **prohibit the use of the altered data**
- **inform the S.Sigy about integrity error**.

FDP_SDI.2/Persistent Stored data integrity monitoring and action

FDP_SDI.2.1/Persistent The TSF shall monitor user data stored in containers controlled by the TSF for **integrity error** on all objects, based on the following attributes: **integrity checked stored data**.

FDP_SDI.2.2/Persistent Upon detection of a data integrity error, the TSF shall

- **prohibit the use of the altered data**
- **inform the S.Sigy about integrity error**.

FDP_RIP.1 Subset residual information protection

FDP_RIP.1.1 The TSF shall ensure that any previous information content of a resource is made unavailable upon the **deallocation of the resource from** the following objects:

o Session keys (PACE-KMAC, PACE-KEnc), (CA-KMAC, CA-KEnc) (immediately after closing related communication session),

o the ephemeral private key ephem - SKPICC- PACE (by having generated a DH shared secret K),

o secret electronic document holder authentication data, e.g. PIN and/or PUK (when their temporarily stored values are not used any more),

o The following data persistently stored by the TOE shall have the user data attribute "integrity checked persistent stored data":

- **SCD**
- **SVD (if persistently stored by the TOE)**

o The following data temporarily stored by the TOE shall have the user data attribute "integrity checked stored data":

- **DTBS/R**.

FDP_ACC.1/Signature_Creation Subset access control

FDP_ACC.1.1/Signature_Creation The TSF shall enforce the **Signature Creation SFP** on **Sending of DTBS/R by SCA and Signing of DTBS/R by Signatory:**

- **subjects: S.User,**
- **objects: DTBS/R, SCD,**
- **operations: signature creation**.

FDP_ACF.1/Signature_Creation Security attribute based access control

FDP_ACF.1.1/Signature_Creation The TSF shall enforce the **Signature Creation SFP** to objects based on the following:

- **the user S.User is associated with the security attribute "Role" and**
- **the SCD with the security attribute "SCD Operational"**.

FDP_ACF.1.2/Signature_Creation The TSF shall enforce the following rules to determine if an operation among controlled subjects and controlled objects is allowed: **R.Sigy is allowed to create electronic signatures for DTBS/R with SCD which security attribute "SCD operational" is set to "yes"**.

FDP_ACF.1.3/Signature_Creation The TSF shall explicitly authorise access of subjects to objects based on the following additional rules: **none**.

FDP_ACF.1.4/Signature_Creation The TSF shall explicitly deny access of subjects to objects based on the following additional rules: **S.User is not allowed to create electronic signatures for DTBS/R with SCD which security attribute "SCD operational" is set to "no"**.

9.1.1.5 Cryptographic support (FCS)

FCS_COP.1 Cryptographic operation

FCS_COP.1.1 The TSF shall perform **refer to the table below** in accordance with a specified cryptographic algorithm **refer to the table below** and cryptographic key sizes **refer to the table below** that meet the following: **refer to the table below:**

Cryptographic Operation	Algorithms	Key size	Norms
Digital signature computation	**RSA PKCS#1v1.5, RSA-PSS PKCS#1 v2.1, with SHA-1 SHA-224 SHA-**	**1024, 1536, 2048, 2560, 3072 and 4096**	**RSA PKCS1 v2.1**

	256 SHA-384 or SHA-512		
Digital signature computation	**ECDSA with SHA-1 SHA-224 SHA-256 SHA-384 or SHA-512**	**256, 320, 384, 512, 521 bits**	**Signature Creation: ANSI_X9.62-2005, Public key cryptography for the financial services Industry: The elliptic curve digital signature algorithm (ECDSA), ANSI, 2005-11-16, section 7.3**
Key agreement	**ECDH**	**192,224,256,320,384,512 and 521**	**419212-1**
Mutual authentication for secure messaging	**3DES CBC EDE 128 bits (encipherment) + Retail MAC with SHA-1, SHA-256**	**128 bits**	**Addendum IAS-ECC v1.0.1**
Mutual authentication for secure messaging	**AES with SHA-256**	**128, 192, 256 bits**	**Addendum IAS-ECC v1.0.1**
PACE Authentication	**PACE IM and GM with ECDH, DES, AES**	**ECDH: 192,224,256, 320,384, 512, 521 bits AES: 128 192 256, DES:128**	**ICAO Technical Report-Supplemental Access Control for Machine Readable Travel Documents Release: 1.01 November 2010**
Secure messaging - Encryption/decryption	**3DES in CBC mode or AES in CBC mode**	**3DES: 128 bits, AES:128, 192, 256 bits**	**Addendum IAS-ECC v1.0.1**

secure messaging - MAC generation and verification	**ISO/IEC 9797-1 algorithm 3 padding 2 (3DES) or CMAC (AES)**	**3DES: 128 bits, AES: 128, 192, 256 bits**	**DES: ISO9797 - AES: NIST SP 800-38B**
Hash calculation within the digital signature sequence	**SHA-1, SHA-224, SHA-256, SHA-384, SHA-512**	**none**	**NIST FIPS PUB 180-2**
Ciphering key encryption	**RSA PKCS#1v1.5**	**1024, 1536, 2048, 2560, 3072, and 4096 bits**	**RSA PKCS1 v2.1**
Ciphering key decryption	**RSA-OAEP, PKCS#1 v2.1, RSA PKCS#1v1.5**	**1024, 1536, 2048, 2560, 3072, and 4096 bits**	**RSA PKCS1 v2.1**

FCS_CKM.4 Cryptographic key destruction

FCS_CKM.4.1 The TSF shall destroy cryptographic keys in accordance with a specified cryptographic key destruction method **physically overwriting the keys in a randomized manner** that meets the following: **none**.

9.1.2 SSCD parts 2, 4 and 5 only

9.1.2.1 Cryptographic support (FCS)

FCS_CKM.1 Cryptographic key generation

FCS_CKM.1.1 The TSF shall generate cryptographic keys in accordance with a specified cryptographic key generation algorithm **[cryptographic key generation algorithm]** and specified cryptographic key sizes **[cryptographic key sizes]** that meet the following: **[list of standards]**

The assignments of the cryptographic operations are described in the table below:

key generation algorithm	**Use**	**key sizes**	**list of standards**
EC key pair generation	**SCD/SVD Generation**	**192,224,256, 320,384, 512 and 521 bits**	**ANS X9.62**
RSA CRT Key pair generation	**SCD/SVD Generation**	**1024, 1536, 2048, 2560, 3072 and 4096 bits**	**RSA PKCS#1 v2.1**

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9.1.2.2 User data protection (FDP)

The security attributes and related status for the subjects and objects are:

Subject or object the security attribute is associated with	Security attribute type	Value of the security attribute
S.User	Role	R.Admin, R.Sigy
S.User	SCD/SVD Management	authorised, not authorised
SCD	SCD Operational	no, yes
SCD	SCD identifier	arbitrary value

FDP_ACC.1/SVD_Transfer Subset access control

FDP_ACC.1.1/SVD_Transfer The TSF shall enforce the **SVD Transfer SFP** on

- **subjects: S.User,**
- **objects: SVD,**
- **operations: export**.

FDP_ACF.1/SVD_Transfer Security attribute based access control

FDP_ACF.1.1/SVD_Transfer The TSF shall enforce the **SVD Transfer SFP** to objects based on the following:

- **the S.User is associated with the security attribute Role,**
- **the SVD**.

FDP_ACF.1.2/SVD_Transfer The TSF shall enforce the following rules to determine if an operation among controlled subjects and controlled objects is allowed: **R.Admin and R.Sigy is allowed to export SVD.**

FDP_ACF.1.3/SVD_Transfer The TSF shall explicitly authorise access of subjects to objects based on the following additional rules: **none**.

FDP_ACF.1.4/SVD_Transfer The TSF shall explicitly deny access of subjects to objects based on the following additional rules: **none**.

FDP_ACC.1/SCD/SVD_Generation Subset access control

FDP_ACC.1.1/SCD/SVD_Generation The TSF shall enforce the **SCD/SVD Generation SFP** on

- **subjects: S.User,**
- **objects: SCD, SVD,**
- **operations: generation of SCD/SVD pair**.

FDP_ACF.1/SCD/SVD_Generation Security attribute based access control

FDP_ACF.1.1/SCD/SVD_Generation The TSF shall enforce the **SCD/SVD Generation SFP** to objects based on the following: **the user S.User is associated with the security attribute "SCD/SVD Management"**.

FDP_ACF.1.2/SCD/SVD_Generation The TSF shall enforce the following rules to determine if an operation among controlled subjects and controlled objects is allowed: **S.User with the security attribute "SCD/SVD Management" set to "authorised" is allowed to generate SCD/SVD pair**.

FDP_ACF.1.3/SCD/SVD_Generation The TSF shall explicitly authorise access of subjects to objects based on the following additional rules: **none**.

FDP_ACF.1.4/SCD/SVD_Generation The TSF shall explicitly deny access of subjects to objects based on the following additional rules: **S.User with the security attribute "SCD/SVD management" set to "not authorised" is not allowed to generate SCD/SVD pair**.

9.1.3 SSCD parts 3 and 6 only

9.1.3.1 Trusted path/channels (FTP)

FTP_ITC.1/SCD Inter-TSF trusted channel

FTP_ITC.1.1/SCD The TSF shall provide a communication channel between itself and another trusted IT product that is logically distinct from other communication channels and provides assured identification of its end points and protection of the channel data from modification or disclosure.

FTP_ITC.1.2/SCD The TSF shall permit **another trusted IT product** to initiate communication via the trusted channel.

FTP_ITC.1.3/SCD The TSF shall initiate communication via the trusted channel for

- **Data exchange integrity according to FDP_UCT.1/SCD**.

9.1.3.2 User data protection (FDP)

The security attributes and related status for the subjects and objects are:

Subject or object the security attribute is associated with	Security attribute type	Value of the security attribute
S.User	Role	R.Admin, R.Sigy
S.User	SCD/SVD Management	authorised, not authorised
SCD	SCD Operational	no, yes
SCD	SCD identifier	arbitrary value

FDP_UCT.1/SCD Basic data exchange confidentiality

FDP_UCT.1.1/SCD [Editorially Refined] The TSF shall enforce the **SCD Import SFP** to **receive SCD** in a manner protected from unauthorised disclosure.

FDP_ITC.1/SCD Import of user data without security attributes

FDP_ITC.1.1/SCD The TSF shall enforce the **SCD Import SFP** when importing user data, controlled under the SFP, from outside of the TOE.

FDP_ITC.1.2/SCD [Editorially Refined] The TSF shall ignore any security attributes associated with the **SCD** when imported from outside the TOE.

FDP_ITC.1.3/SCD The TSF shall enforce the following rules when importing user data controlled under the SFP from outside the TOE: **The SCD shall be sent by an authorized trusted IT environment**.

FDP_ACC.1/SCD_Import Subset access control

FDP_ACC.1.1/SCD_Import The TSF shall enforce the **SCD Import SFP** on

- **subjects: S.User,**
- **objects: SCD,**
- **operations: import of SCD**.

FDP_ACF.1/SCD_Import Security attribute based access control

FDP_ACF.1.1/SCD_Import The TSF shall enforce the **SCD Import SFP** to objects based on the following: **the user S.User is associated with the security attribute "SCD/SVD Management"**.

FDP_ACF.1.2/SCD_Import The TSF shall enforce the following rules to determine if an operation among controlled subjects and controlled objects is allowed: **S.User with the security attribute "SCD/SVD Management" set to "authorised" is allowed to import SCD**.

FDP_ACF.1.3/SCD_Import The TSF shall explicitly authorise access of subjects to objects based on the following additional rules: **none**.

FDP_ACF.1.4/SCD_Import The TSF shall explicitly deny access of subjects to objects based on the following additional rules: **S.User with the security attribute "SCD/SVD management" set to "not authorised" is not allowed to import SCD**.

9.1.4 SSCD part 4 only

9.1.4.1 Trusted path/channels (FTP)

FTP_ITC.1/SVD Inter-TSF trusted channel

FTP_ITC.1.1/SVD [Editorially Refined] The TSF shall provide a communication channel between itself and another trusted IT product **CGA** that is logically distinct from other communication channels and provides assured identification of its end points and protection of the channel data from modification or disclosure.

FTP_ITC.1.2/SVD [Editorially Refined] The TSF shall permit **the CGA** to initiate communication via the trusted channel.

FTP_ITC.1.3/SVD [Editorially Refined] The TSF **or the CGA shall** initiate communication via the trusted channel for

- **data Authentication with Identity of Guarantor according to FIA_API.1 and FDP_DAU.2/SVD**.

9.1.4.2 User data protection (FDP)

FDP_DAU.2/SVD Data Authentication with Identity of Guarantor

FDP_DAU.2.1/SVD The TSF shall provide a capability to generate evidence that can be used as a guarantee of the validity of **SVD**.

FDP_DAU.2.2/SVD The TSF shall provide **CGA** with the ability to verify evidence of the validity of the indicated information and the identity of the user that generated the evidence.

9.1.4.3 Identification and authentication (FIA)

FIA_API.1 Authentication Proof of Identity

FIA_API.1.1 The TSF shall provide a

- **Mutual Authentication according to [IAS ADD]**
- **PACE Authentication according to [ICAO-9303]**

to prove the identity of the **SSCD**.

9.1.5 SSCD parts 5 and 6 only

9.1.5.1 User data protection (FDP)

FDP_UIT.1/DTBS Data exchange integrity

FDP_UIT.1.1/DTBS The TSF shall enforce the **Signature Creation SFP** to **receive** user data in a manner protected from **modification and insertion** errors.

FDP_UIT.1.2/DTBS The TSF shall be able to determine on receipt of user data, whether **modification and insertion** has occurred.

9.1.5.2 Trusted path/channels (FTP)

FTP_ITC.1/VAD Inter-TSF trusted channel

FTP_ITC.1.1/VAD [Editorially Refined] The TSF shall provide a communication channel between itself and another trusted IT product **HID** that is logically distinct from other communication channels and provides assured identification of its end points and protection of the channel data from modification or disclosure.

FTP_ITC.1.2/VAD [Editorially Refined] The TSF shall permit **the HID** to initiate communication via the trusted channel.

FTP_ITC.1.3/VAD [Editorially Refined] The TSF **or the HID** shall initiate communication via the trusted channel for:

- **User authentication according to FIA_UAU.1**

FTP_ITC.1/DTBS Inter-TSF trusted channel

FTP_ITC.1.1/DTBS [Editorially Refined] The TSF shall provide a communication channel between itself and another trusted IT product **SCA** that is logically distinct from other communication channels and provides assured identification of its end points and protection of the channel data from modification or disclosure.

FTP_ITC.1.2/DTBS [Editorially Refined] The TSF shall permit **the SCA** to initiate communication via the trusted channel.

FTP_ITC.1.3/DTBS [Editorially Refined] The TSF **or the SCA** shall initiate communication via the trusted channel for **signature creation**.

9.1.6 Additional SFRs related to EAC2

FCS_RND.1 Quality metric for random numbers

FCS_RND.1.1 The TSF shall provide a mechanism to generate random numbers that meet **Class PTG.2 according to AIS31 [AIS31]**.

FCS_CKM.1/DH_PACE Cryptographic key generation

FCS_CKM.1.1/DH_PACE The TSF shall generate cryptographic keys in accordance with a specified cryptographic key generation algorithm **ECDH compliant to [TR03111]** and specified cryptographic key sizes **192, 224, 256 and 320, 384, 512, and 521 bits in combination with 112 bits 3DES or 128, 192 or 256 bits AES** that meet the following: **[TR-03110-2]**.

FCS_COP.1/SHA Cryptographic operation

FCS_COP.1.1/SHA The TSF shall perform **Hashing** in accordance with a specified cryptographic algorithm **SHA-1, SHA-224, SHA-256, SHA-384 and SHA-512** and cryptographic key sizes **none** that meet the following: **[FIPS180-4]**.

FCS_COP.1/SIG_VER Cryptographic operation

FCS_COP.1.1/SIG_VER The TSF shall perform **digital signature verification** in accordance with a specified cryptographic algorithm **ECDSA** and cryptographic key sizes **160, 192, 224, 256, 320, 384, 512 and 521 bits** that meet the following: **ISO15946-2 specified in [ISO15946-2], in combination with SHA-1, SHA-224, SHA-256, SHA-384 and SHA-512 digest algorithms**.

Application Note:

This SFR is concerned with Terminal Authentication 2, cf. [TR-03110-2].

FCS_COP.1/PACE_ENC Cryptographic operation

FCS_COP.1.1/PACE_ENC The TSF shall perform **refer to table below** in accordance with a specified cryptographic algorithm **refer to table below** and cryptographic key sizes **refer to table below** that meet the following: **refer to table below**

Cryptographic Operations	Algorithms	Key sizes	Norms
secure messaging-encryption and decryption	AES in CBC mode	128, 192 and 256 bits	[TR-03110-3]
secure messaging-encryption and decryption	TDES in CBC mode	112 bits	[IAS-ECC]

FCS_COP.1/PACE_MAC Cryptographic operation

FCS_COP.1.1/PACE_MAC The TSF shall perform **refer table below** in accordance with a specified cryptographic algorithm **refer table below** and cryptographic key sizes **refer table below** that meet the following: **refer table below**

Cryptographic Operations	Algorithms	Key sizes	Norms
secure messaging - message authentication code	**CMAC**	**128, 192 and 256 bits**	**[TR-03110-2]**
secure messaging - message authentication code	**Retail-MAC**	**112 bits**	**[TR-03110-2]**

FIA_UAU.1/PACE Timing of authentication

FIA_UAU.1.1/PACE [Editorially Refined] The TSF shall allow

- **To establish a communication channel,**
- **Carrying out the PACE (PIN, PUK, MRZ or CAN) protocol according to [TR03110-2],**
- **To read the Initialization Data if it is not disabled by TSF according to FMT_MTD.1/INI_DIS,**

on behalf of the user to be performed before the user is authenticated.

FIA_UAU.1.2/PACE The TSF shall require each user to be successfully authenticated before allowing any other TSF-mediated actions on behalf of that user.

FIA_UAU.5/PACE Multiple authentication mechanisms

FIA_UAU.5.1/PACE [Editorially Refined] The TSF shall provide

- **PACE (PIN, PUK, MRZ or CAN) protocol according to [TR03110-2],**
- **Secure Messaging according to [TR03110-3],**
- **Symmetric Authentication Mechanism based on AES or TDES,**
- **Terminal Authentication 2 protocol according to [TR03110-2],**
- **Chip Authentication 2 according to [TR03110-2]**

to support user authentication.

FIA_UAU.5.2/PACE [Editorially Refined] The TSF shall authenticate any user's claimed identity according to the **following rules:**

- **Having successfully run the PACE (PIN, PUK, MRZ or CAN) protocol the TOE accepts only received commands with correct message authentication codes sent by secure messaging with the key agreed with the terminal by the PACE protocol.**

- **The TOE accepts the authentication attempt by means of the Terminal Authentication 2 protocol, only if (i) the terminal presents its static public key PKPCD and the key is successfully verifiable up to the CVCA and (ii) the terminal uses the PICC identifier IDPICC = Comp (ephem-PKPICC-PACE) calculated during, and the secure messaging established by the current PACE (PIN, PUK, MRZ or CAN) authentication.**
- **Having successfully run Chip Authentication 2, the TOE accepts only received commands with correct message authentication codes sent by secure messaging with the key agreed with the terminal by Chip Authentication 2**.

FIA_AFL.1/Suspend_PIN Authentication failure handling

FIA_AFL.1.1/Suspend_PIN [Editorially Refined] The TSF shall detect when **an administrator configurable positive integer within 1 byte** unsuccessful authentication attempts occur related to **consecutive failed authentication attempts using the PIN or PUK as the shared password for PACE**.

FIA_AFL.1.2/Suspend_PIN [Editorially Refined] When the defined number of unsuccessful authentication attempts has been **met**, the TSF shall **suspend the reference value of the PIN or PUK according to [TR03110-2]**.

FIA_AFL.1/Block_PIN Authentication failure handling

FIA_AFL.1.1/Block_PIN [Editorially Refined] The TSF shall detect when **an administrator configurable positive integer within 1 byte** unsuccessful authentication attempts occur related to **consecutive failed authentication attempts using the suspended PIN or PUK as the shared password for PACE**.

FIA_AFL.1.2/Block_PIN [Editorially Refined] When the defined number of unsuccessful authentication attempts has been **met**, the TSF shall **block the reference value of PIN or PUK according to [TR03110-2]**.

FIA_AFL.1/PACE Authentication failure handling

FIA_AFL.1.1/PACE [Editorially Refined] The TSF shall detect when **an administrator configurable positive integer within 1 byte** unsuccessful authentication attempts occur related to **authentication attempts using the PIN, PUK, MRZ or CAN password as the shared password for PACE**.

FIA_AFL.1.2/PACE When the defined number of unsuccessful authentication attempts has been **met**, the TSF shall **delay each of the following authentication attempts until the next successful authentication attempt by an configurable amount of time**.

FIA_UAU.1/EAC2_Terminal Timing of authentication

FIA_UAU.1.1/EAC2_Terminal [Editorially Refined] The TSF shall allow

- **To establish a communication channel,**
- **Carrying out the PACE (PIN, PUK, MRZ or CAN) protocol according to [TR03110-2],**
- **To read the Initialization Data if it is not disabled by TSF according to FMT_MTD.1/INI_DIS,**
- **Carrying out the Terminal Authentication protocol 2 according to [TR03110-2]**

on behalf of the user to be performed before the user is authenticated.

FIA_UAU.1.2/EAC2_Terminal The TSF shall require each user to be successfully authenticated before allowing any other TSF-mediated actions on behalf of that user.

FIA_API.1/CA Authentication Proof of Identity

FIA_API.1.1/CA The TSF shall provide a **protocol Chip Authentication 2 according to [TR03110-2]** to prove the identity of the **TOE**.

FIA_UAU.6/CA Re-authenticating

FIA_UAU.6.1/CA The TSF shall re-authenticate the user under the conditions **each command sent to the TOE after a successful run of Chip Authentication 2 shall be verified as being sent by the EAC2 terminal**.

FIA_UID.1/PACE Timing of identification

FIA_UID.1.1/PACE [Editorially Refined] The TSF shall allow

- **To establish a communication channel,**
- **Carrying out the PACE (PIN, PUK, MRZ or CAN) protocol according to [TR03110-2],**
- **To read the Initialization Data if it is not disabled by TSF according to FMT_MTD.1/INI_DIS**

on behalf of the user to be performed before the user is identified.

FIA_UID.1.2/PACE The TSF shall require each user to be successfully identified before allowing any other TSF-mediated actions on behalf of that user.

FIA_UID.1/EAC2_Terminal Timing of identification

FIA_UID.1.1/EAC2_Terminal [Editorially Refined] The TSF shall allow

- **To establish a communication channel,**
- **Carrying out the PACE (PIN, PUK, MRZ or CAN) protocol according to [TR03110-2],**
- **To read the Initialization Data if it is not disabled by TSF according to FMT_MTD.1/INI_DIS,**
- **Carrying out the Terminal Authentication protocol 2 according to [TR03110-2]**

on behalf of the user to be performed before the user is identified.

FIA_UID.1.2/EAC2_Terminal The TSF shall require each user to be successfully identified before allowing any other TSF-mediated actions on behalf of that user.

FIA_UAU.4/PACE Single-use authentication mechanisms

FIA_UAU.4.1/PACE [Editorially Refined] The TSF shall prevent reuse of authentication data related to

- **PACE (PIN, PUK, MRZ or CAN) protocol according to [TR03110-2],**
- **Terminal Authentication 2 protocol according to [TR03110-2]**.

FIA_UAU.6/PACE Re-authenticating

FIA_UAU.6.1/PACE The TSF shall re-authenticate the user under the conditions **each command sent to the TOE after successful run of the PACE protocol shall be verified as being sent by the PACE terminal**.

FDP_ACC.1/TRM Subset access control

FDP_ACC.1.1/TRM The TSF shall enforce the **Access Control SFP** on **terminals gaining access User data stored in the TOE (including sensitive user data) and selected by the personalization agent, and all TOE intrinsic secret (i.e. cryptographic) data.**

FDP_ACF.1/TRM Security attribute based access control

FDP_ACF.1.1/TRM The TSF shall enforce the **Access Control SFP** to objects based on the following:

- **Subjects: Terminal, PACE terminal, EAC2 terminal.**
- **Objects:**
  a. **User data stored in the TOE (including sensitive user data) and selected by the personalization agent,**
  b. **all TOE intrinsic secret (i.e. cryptographic) data.**
- **Security attributes: Terminal Authorization Level (access rights)**.

FDP_ACF.1.2/TRM The TSF shall enforce the following rules to determine if an operation among controlled subjects and controlled objects is allowed: **A PACE terminal is allowed to read data objects data (object 2.a) specified in FDP_ACF.1.1/TRM after successful PACE authentication according to [TR03110-2], as required by FIA_UAU.1/PACE**.

FDP_ACF.1.3/TRM The TSF shall explicitly authorise access of subjects to objects based on the following additional rules: **none**.

FDP_ACF.1.4/TRM The TSF shall explicitly deny access of subjects to objects based on the following additional rules:

- **Any terminal not being a PACE terminal or an EAC2 terminal is not allowed to read, to write, to modify, or to use any user data (object 2.a) specified in FDP_ACF.1.1/TRM.**
- **Terminals not using secure messaging are not allowed to read, write, modify, or use any user data (object 2.a) specified in FDP_ACF.1.1/TRM.**
- **Reading, modifying, writing, or using sensitive user data protected by TAv2 and CAv2 (object 2.a specified in FDP_ACF.1.1/TRM) is only allowed to EAC2 terminals using the following mechanism: The TOE applies the EAC2 protocol (cf. FIA_UAU.5) to determine access rights**

of the terminal according to [TR03110-2]. To determine the effective authorization of a terminal, the chip must calculate a bitwise Boolean 'and' of the relative authorization contained in the CHAT and Extended CHAT of the Terminal Certificate, the referenced DV Certificate, and the referenced CVCA Certificate. Based on the terminal type drawn from the CHAT and Extended CHAT of the Terminal Certificate, the TOE shall grant the right to read, modify or write sensitive user data, or perform operations using these sensitive user data.

- **No subject is allowed to read, write, modify, or use the data objects TOE intrinsic secrets (object 2.b) specified in FDP_ACF.1.1/TRM**.

FDP_UCT.1/TRM Basic data exchange confidentiality

FDP_UCT.1.1/TRM The TSF shall enforce the **Access Control SFP** to **transmit** user data in a manner protected from unauthorised disclosure.

FDP_UIT.1/TRM Data exchange integrity

FDP_UIT.1.1/TRM The TSF shall enforce the **Access Control SFP** to **transmit and receive** user data in a manner protected from **modification, deletion, insertion and replay** errors.

FDP_UIT.1.2/TRM The TSF shall be able to determine on receipt of user data, whether **modification, deletion, insertion and replay** has occurred.

FTP_ITC.1/PACE Inter-TSF trusted channel

FTP_ITC.1.1/PACE [Editorially Refined] The TSF shall provide a communication channel between itself and a **PACE terminal** that is logically distinct from other communication channels and provides assured identification of its end points and protection of the channel data from modification or disclosure. **The trusted channel shall be established by performing the PACE protocol according to [TR03110-2].**

FTP_ITC.1.2/PACE [Editorially Refined] The TSF shall permit **a PACE terminal** to initiate communication via the trusted channel.

FTP_ITC.1.3/PACE [Editorially Refined] The TSF shall initiate communication via the trusted channel for **any data exchange between the TOE and a PACE terminal after PACE**.

FMT_SMR.1/PACE Security roles

FMT_SMR.1.1/PACE The TSF shall maintain the roles

- **Manufacturer,**
- **Personalization Agent,**
- **Terminal,**
- **PACE terminal,**
- **Country Verifying Certification Authority,**
- **Document Verifier,**
- **EAC2 terminal,**
- **Electronic document holder**.

FMT_SMR.1.2/PACE The TSF shall be able to associate users with roles.

FMT_MTD.1/CVCA_INI Management of TSF data

FMT_MTD.1.1/CVCA_INI The TSF shall restrict the ability to **write** the

- **Initial CVCA Public Key,**
- **meta-data of the initial CVCA Certificate as required in [TR03110-2], resp [TR03110-3]**
- **initial Current Date**

to **the personalization agent**.

FMT_MTD.1/CVCA_UPD Management of TSF data

FMT_MTD.1.1/CVCA_UPD The TSF shall restrict the ability to **update** the

- **CVCA Public Key (PKCVCA),**
- **meta-data of the CVCA Certificate as required by [TR03110-2], resp [TR03110-3]**

to **the Country Verifying Certification Authority**.

FMT_MTD.1/DATE Management of TSF data

FMT_MTD.1.1/DATE The TSF shall restrict the ability to **modify** the **the current date** to

- **CVCA,**
- **Document Verifier,**
- **EAC2 terminal possessing an Accurate Terminal Certificate according to [TR03110-3]**.

FMT_MTD.1/PA Management of TSF data

FMT_MTD.1.1/PA The TSF shall restrict the ability to **write** the **card/chip security object(s) (SOC) selected in Access Control SFP and the document Security Object (SOD) selected in Access Control SFP** to **the Personalization Agent**.

FMT_MTD.1/SK_PICC Management of TSF data

FMT_MTD.1.1/SK_PICC The TSF shall restrict the ability to **load** the **Chip Authentication private key(s) (SKPICC) selected in Access Control SFP** to **the personalization agent**.

FMT_MTD.1/KEY_READ Management of TSF data

FMT_MTD.1.1/KEY_READ The TSF shall restrict the ability to **read** the

- **PACE passwords,**
- **The Chip Authentication private key(s) (SKPICC)**

to **none**.

FMT_MTD.1/Initialize_PIN Management of TSF data

FMT_MTD.1.1/Initialize_PIN The TSF shall restrict the ability to **write** the **PIN, PUK, MRZ and CAN, selected in Access Control SFP** to **the personalization agent**.

FMT_MTD.1/Resume_PIN Management of TSF data

FMT_MTD.1.1/Resume_PIN The TSF shall restrict the ability to **resume** the **suspended PIN selected in Access Control SFP** to **the electronic document holder (Signatory)**.

FMT_MTD.1/Change_PIN Management of TSF data

FMT_MTD.1.1/Change_PIN The TSF shall restrict the ability to **change** the **blocked PIN selected in Access Control SFP** to

- **The electronic document holder (using the Current PUK for changing),**
- **An authorized terminal that has access to change the current PIN.**

FMT_MTD.1/Unblock_PIN Management of TSF data

FMT_MTD.1.1/Unblock_PIN The TSF shall restrict the ability to **unblock** the **blocked PIN selected in Access Control SFP** to

- **the electronic document holder (using the PUK for unblocking),**
- **An authorized terminal that has access to unblock the current PIN.**

FMT_MTD.3 Secure TSF data

FMT_MTD.3.1 The TSF shall ensure that only secure values are accepted for **TSF data of the Terminal Authentication protocol 2 and the Access Control SFP**.

FMT_MTD.1/INI_ENA Management of TSF data

FMT_MTD.1.1/INI_ENA The TSF shall restrict the ability to **write** the **Initialisation Data and the Pre-personalisation Data** to **the Manufacturer**.

FMT_MTD.1/INI_DIS Management of TSF data

FMT_MTD.1.1/INI_DIS The TSF shall restrict the ability to **read out** the **Initialisation Data and the Pre-personalisation Data** to **the Personalisation Agent**.

FTP_ITC.1/CA2 Inter-TSF trusted channel

FTP_ITC.1.1/CA2 [Editorially Refined] The TSF shall provide a communication channel between itself and **an EAC2 terminal** that is logically distinct from other communication channels and provides assured identification of its end points and protection of the channel data from modification or disclosure. **The trusted channel shall be established by performing the CA2 protocol according to [TR03110-2].**

FTP_ITC.1.2/CA2 [Editorially Refined] The TSF shall permit **an EAC2 terminal** to initiate communication via the trusted channel.

FTP_ITC.1.3/CA2 [Editorially Refined] The TSF shall initiate communication via the trusted channel for **any data exchange between the TOE and an EAC2 terminal after Chip Authentication 2**.

FMT_LIM.1 Limited capabilities

FMT_LIM.1.1 The TSF shall be designed in a manner that limits their capabilities so that in conjunction with 'Limited availability (FMT_LIM.2)' the following policy is enforced

Deploying test features after TOE delivery do not allow

- **User Data to be manipulated and disclosed,**
- **TSF data to be manipulated or disclosed,**
- **software to be reconstructed,**
- **substantial information about construction of TSF to be gathered which may enable other attacks**

FMT_LIM.2 Limited capabilities

FMT_LIM.2.1 The TSF shall be designed in a manner that limits their availability so that in conjunction with 'Limited capabilities (FMT_LIM.1)' the following policy is enforced

Deploying test features after TOE delivery do not allow

- **User Data to be manipulated and disclosed,**
- **TSF data to be manipulated or disclosed,**
- **software to be reconstructed,**
- **substantial information about construction of TSF to be gathered which may enable other attacks**

9.2 Security Assurance Requirements

The Evaluation Assurance Level is EAL5 augmented with AVA_VAN.5 and ALC_DVS.2.

9.3 Security Requirements Rationale

9.3.1 Objectives

9.3.1.1 Security Objectives for the TOE

All SSCD parts

OT.Tamper_Resistance is provided by FPT_PHP.3 to resist physical attacks.

OT.Tamper_ID is provided by FPT_PHP.1 by the means of passive detection of physical attacks.

OT.EMSEC_Design covers that no intelligible information is emanated. This is provided by FPT_EMS.1.1.

OT.DTBS_Integrity_TOE ensures that the DTBS/R is not altered by the TOE. The integrity functions specified by FDP_SDI.2/DTBS require that the DTBS/R has not been altered by the TOE.

OT.Sigy_SigF is provided by an SFR for identification authentication and access control.

FIA_UAU.1 and FIA_UID.1 ensure that no signature creation function can be invoked before the signatory is identified and authenticated. The security functions specified by FMT_MTD.1/Admin and FMT_MTD.1/Signatory manage the authentication function. SFR FIA_AFL.1 provides protection against a number of attacks, such as cryptographic extraction of residual information, or brute force attacks against authentication. The security function specified by FDP_SDI.2/DTBS ensures the integrity of stored DTBS and FDP_RIP.1 prevents misuse of any resources containing the SCD after de-allocation (e.g. after the signature creation process).

The security functions specified by FDP_ACC.1/Signature_Creation and FDP_ACF.1/Signature_Creation provide access control based on the security attributes managed according to the SFR FMT_MTD.1/Signatory, FMT_MSA.2, FMT_MSA.3 and FMT_MSA.4. The SFR FMT_SMF.1 and FMT_SMR.1 list these management functions and the roles. These ensure that the signature process is restricted to the signatory. FMT_MOF.1 restricts the ability to enable the signature creation function to the signatory. FMT_MSA.1/Signatory restricts the ability to modify the security attributes SCD operational to the signatory.

OT.Sig_Secure is provided by the cryptographic algorithms specified by FCS_COP.1, which ensures the cryptographic robustness of the signature algorithms. FDP_SDI.2/Persistent corresponds to the integrity of the SCD implemented by the TOE and FPT_TST.1 ensures self-tests ensuring correct signature creation.

OT.SCD_Secrecy is provided by the security functions specified by the following SFR. FCS_CKM.1 ensures the use of secure cryptographic algorithms for SCD/SVD generation. Cryptographic quality of SCD/SVD pair shall prevent disclosure of SCD by cryptographic attacks using the publicly known SVD. The security functions specified by FDP_RIP.1 and

FCS_CKM.4 ensure that residual information on SCD is destroyed after the SCD has been use for signature creation and that destruction of SCD leaves no residual information.

The security functions specified by FDP_SDI.2/Persistent ensure that no critical data is modified which could alter the efficiency of the security functions or leak information of the SCD. FPT_TST.1 tests the working conditions of the TOE and FPT_FLS.1 guarantees a secure state when integrity is violated and thus assures that the specified security functions are operational. An example where compromising error conditions are countered by FPT_FLS.1 is fault injection for differential fault analysis (DFA). FDP_UCT.1/SCD and FTP_ITC.1/SCD ensures the confidentiality for SCD import.SFR FPT_EMS.1 and FPT_PHP.3 require additional security features of the TOE to ensure the confidentiality of the SCD.

OT.Lifecycle_Security is provided by the SFR for SCD/SVD generation FCS_CKM.1, SCD usage FCS_COP.1 and SCD destruction FCS_CKM.4 which ensure cryptographically secure lifecycle of the SCD. The SCD/SVD generation is controlled by TSF according to FDP_ACC.1/SCD/SVD_Generation and FDP_ACF.1/SCD/SVD_Generation. The SVD transfer for certificate generation is controlled by TSF according to FDP_ACC.1/SVD_Transfer and FDP_ACF.1/SVD_Transfer. The SCD usage is ensured by access control FDP_ACC.1/Signature_Creation, FDP_ACF.1/Signature_Creation which is based on the security attribute secure TSF management according to FMT_MOF.1, FMT_MSA.1/Admin, FMT_MSA.1/Signatory, FMT_MSA.2, FMT_MSA.3, FMT_MSA.4, FMT_MTD.1/Admin, FMT_MTD.1/Signatory, FMT_SMF.1 and FMT_SMR.1. The test functions FPT_TST.1 provides failure detection throughout the lifecycle. The SCD import is controlled by TSF according to FDP_ACC.1/SCD_Import, FDP_ACF.1/SCD_Import and FDP_ITC.1/SCD. The confidentiality of the SCD is protected during import according to FDP_UCT.1/SCD in the trusted channel FTP_ITC.1/SCD.

SSCD parts 2, 4 and 5 only

OT.SCD_SVD_Corresp addresses that the SVD corresponds to the SCD implemented by the TOE. This is provided by the algorithms specified by FCS_CKM.1 to generate corresponding SVD/SCD pairs. The security functions specified by FDP_SDI.2/Persistent ensure that the keys are not modified, so to retain the correspondence. Moreover, the SCD Identifier allows the environment to identify the SCD and to link it with the appropriate SVD. The management functions identified by FMT_SMF.1 and by FMT_MSA.4 allow R.Admin to modify the default value of the security attribute SCD Identifier.

OT.SCD_Unique implements the requirement of practically unique SCD as laid down in Annex III [DIR], paragraph 1(a), which is provided by the cryptographic algorithms specified by FCS_CKM.1.

OT.SCD/SVD_Gen addresses that generation of a SCD/SVD pair requires proper user authentication. The TSF specified by FIA_UID.1 and FIA_UAU.1 provide user identification and user authentication prior to enabling access to authorised functions. The SFR FDP_ACC.1/SCD/SVD_Generation and FDP_ACF.1/SCD/SVD_Generation provide access control for the SCD/SVD generation. The security attributes of the authenticated user are provided by FMT_MSA.1/Admin, FMT_MSA.2, and FMT_MSA.3 for static attribute initialisation. The SFR FMT_MSA.4 defines rules for inheritance of the security attribute 'SCD operational' of the SCD.

SSCD parts 3 and 6 only

OT.SCD_Auth_Imp is provided by the security functions specified by the following SFR. FIA_UID.1 and FIA_UAU.1 ensure that the user is identified and authenticated before SCD can be imported. FDP_ACC.1/SCD_Import and FDP_ACF.1/SCD_Import ensure that only authorised users can import SCD.

SSCD part 4 only

OT.TOE_SSCD_Auth requires the TOE to provide security mechanisms to identify and to authenticate themselves as SSCD, which is directly provided by FIA_API.1 (Authentication Proof of Identity). The SFR FIA_UAU.1 allows (additionally to the core PP Part2 SSCD KG) establishment of the trusted channel before (human) user is authenticated.

OT.TOE_TC_SVD_Exp requires the TOE to provide a trusted channel to the CGA to protect the integrity of the SVD exported to the CGA, which is directly provided by

- The SVD transfer for certificate generation is controlled by TSF according to FDP_ACC.1/SVD_Transfer and FDP_ACF.1/SVD_Transfer.
- FDP_DAU.2/SVD (Data Authentication with Identity of Guarantor), which requires the TOE to provide CGA with the ability to verify evidence of the validity of the SVD and the identity of the user that generated the evidence.
- FTP_ITC.1/SVD Inter-TSF trusted channel), which requires the TOE to provide a trusted channel to the CGA.

SSCD parts 5 and 6 only

OT.TOE_TC_VAD_Imp is provided by FTP_ITC.1/VAD to provide a trusted channel to protect the VAD provided by the HID to the TOE.

OT.TOE_TC_DTBS_Imp is provided by FTP_ITC.1/DTBS to provide a trusted channel to protect the DTBS provided by the SCA to the TOE and by FDP_UIT.1/DTBS, which requires the TSF to verify the integrity of the received DTBS.

Security Objectives OT related to EAC2

OT.AC_Pers_EAC2 The security objective OT.AC_Pers_EAC2 ensures that only the personalization agent can write user- and TSF-Data into the TOE, and that some of this data cannot be altered after personalization. This property is covered by FDP_ACC.1/TRM and FDP_ACF.1/TRM requiring, amongst other, an appropriate authorization level of an EAC2 terminal. This authorization level can be achieved by terminal identification/authentication as required by the SFRs FIA_UID.1/EAC2_Terminal and FIA_UAU.1/EAC2_Terminal. The SFRs FMT_SMF.1 and FMT_SMR.1/PACE support the related functions and roles. Since only an EAC2 terminal can reach the necessary authorization level, using and managing the PIN (the related SFRs are FIA_AFL.1/Suspend_PIN, FIA_AFL.1/Block_PIN, FMT_MTD.1/Resume_PIN, FMT_MTD.1/Change_PIN, FMT_MTD.1/Unblock_PIN, and FMT_MTD.1/Activate_PIN, FMT_MTD.1/Initialize_PIN) also support the achievement of this objective. FDP_RIP.1 requires erasing the temporal values PIN and PUK. The justification for the SFRs FMT_MTD.1/INI_ENA and FMT_MTD.1/INI_DIS arises from the justification for OT.Identification above with respect to the pre-personalization data. FMT_MTD.1/PA covers the related property of OT.AC_Pers_EAC2 (writing/updating SOC and SOD and, in generally, personalization data). Updating such data can only be done by the personalization agent prior to the operational phase. Thus such data cannot be changed after the personalization of the document, as required by OT.AC_Pers_EAC2. Finally, FMT_MTD.1/KEY_READ ensures that cryptographic keys for EAC2 can not be read by users.

OT.CA2 The security objective OT.CA2 aims at enabling verification of the authenticity of the TOE as a whole device.This objective is mainly achieved by FIA_API.1/CA using FCS_CKM.1/DH_PACE. CA2 provides an evidence of possessing the Chip Authentication Private Key (SKPICC). FMT_MTD.1/SK_PICC governs creating/loading SKPICC, whereas FMT_MTD.1/KEY_READ requires making this key unreadable by users. Hence, its value remains confidential. FDP_RIP.1 requires erasing the values of SKPICC and the session keys, here for CMAC.The authentication token TPICC is calculated using FCS_COP.1/PACE_MAC. The SFRs FCS_COP.1/SHA and FCS_RND.1 represent the general required support for cryptographic operations.FMT_MTD.1/PA requires that the SOC (containing amongst other, the signature of PKPICC) used for Passive Authentication is allowed to be modified only by the personalization agent only. Hence is to consider as trustworthy.

OT.Sens_Data_EAC2 The security objective of OT.Sens_Data_EAC2 aims to explicitly protect sensitive (as opposed to common) user and TSF-Data. This is mainly achieved by enforcing (FDP_UCT.1/TRM and FDP_UIT.1/TRM) the access control SFPs FDP_ACC.1/TRM and FDP_ACF.1/TRM.A specific authorization level is achieved by terminal identification/authentication as required by the SFRs FIA_UID.1/EAC2_Terminal, FIA_UAU.1/EAC2_Terminal, supported by FCS_COP.1/SIG_VER. The TA2 protocol uses the result of the PACE authentication (FIA_UID.1/PACE, FIA_UAU.1/PACE, confidentiality of the PACE passwords is ensured by FMT_MTD.1/KEY_READ) being, in turn, supported by FCS_CKM.1/DH_PACE. Since PACE can use the PIN as the shared secret, the use and management of the PIN (FIA_AFL.1/Suspend_PIN, FIA_AFL.1/Block_PIN, FMT_MTD.1/Resume_PIN, FMT_MTD.1/Unblock_PIN, FMT_MTD.1/Initialize_PIN, FMT_MTD.1/Change_PIN, FMT_MTD.1/Activate_PIN) also support to achieve this objective. FDP_RIP.1 requires erasing the temporal values of the PIN and PUK. FIA_UAU.4/PACE, FIA_UAU.5/PACE, FIA_UAU.6/PACE and FCS_CKM.4 represent some specific properties of the used protocols.To allow for a verification of the certificate chain as required in FMT_MTD.3, the CVCA's public key and certificate as well as the current date are written or updated by authorized identified role as required by FMT_MTD.1/CVCA_INI, FMT_MTD.1/CVCA_UPD and FMT_MTD.1/DATE.This objective for the data exchanged is mainly achieved by FTP_ITC.1/CA2 and FTP_ITC.1/PACE using FCS_COP.1/PACE_ENC. A prerequisite for establishing this trusted channel is a successful Chip Authentication 2, cf. FIA_API.1/CA using FCS_CKM.1/DH_PACE and possessing the special properties FIA_UAU.5/PACE, and FIA_UAU.6/CA. As a prerequisite of this trusted channel, a trusted channel is established with the PACE protocol using FIA_UID.1/PACE, FIA_UAU.1/PACE and FCS_CKM.1/DH_PACE and possessing the special properties FIA_UAU.5/PACE, FIA_UAU.6/PACE. CA2 provides an evidence of possessing the Chip Authentication Private Key (SKPICC). FMT_MTD.1/SK_PICC governs creating/loading

SKPICC, FMT_MTD.1/KEY_READ requires making this key unreadable by users. Thus its value remains confidential. FDP_RIP.1 requires erasing the values of SKPICC and session keys, here for KENC.FMT_MTD.1/PA requires that only the the personalization agent is allowed to modify the SOC (containing amongst other, the signature of PKPICC) used for Passive Authentication. The SFRs FCS_COP.1/SHA and FCS_RND.1 represent the general required support for cryptographic operations.The SFRs FMT_SMF.1 and FMT_SMR.1/PACE support the related functions and roles.

OT.Data_Authenticity The security objective OT.Data_Authenticity ensures the authenticity of user- and TSF-Data (after Terminal- and the Chip Authentication 2) by enabling its verification on both the terminal-side and by an active verification by the TOE itself.This objective is mainly achieved by FTP_ITC.1/CA2 and FTP_ITC.1/PACE using FCS_COP.1/PACE_MAC. A prerequisite for establishing this trusted channel is a successful Chip Authentication 2, cf. FIA_API.1/CA using FCS_CKM.1/DH_PACE and possessing the special properties FIA_UAU.5/PACE, and FIA_UAU.6/CA. As a prerequisite of this trusted channel, a trusted channel is established with the PACE protocol using FIA_UID.1/PACE, FIA_UAU.1/PACE and FCS_CKM.1/DH_PACE and possessing the special properties FIA_UAU.5/PACE, FIA_UAU.6/PACE. CA2 provides an evidence of possessing the Chip Authentication Private Key (SKPICC). FMT_MTD.1/SK_PICC governs creating/loading SKPICC, FMT_MTD.1/KEY_READ requires to make this key unreadable by users. Hence its value remains confidential. FDP_RIP.1 requires to erase the values of SKPICC and session keys, here for KMAC. FMT_MTD.1/PA requires that the SOC (containing amongst other, the signature of PKPICC) used for Passive Authentication is allowed to be modified only by the personalization agent only. Hence is to consider as trustworthy.A prerequisite for successful CA2 is an accomplished TA2 as required by FIA_UID.1/EAC2_Terminal, FIA_UAU.1/EAC2_Terminal, supported by FCS_COP.1/SIG_VER. The TA2 protocol uses the result of the PACE authentication (FIA_UID.1/PACE, FIA_UAU.1/PACE) being, in turn, supported by FCS_CKM.1/DH_PACE. Since PACE can use the PIN as the shared secret, the use and management of the PIN (FIA_AFL.1/Suspend_PIN, FIA_AFL.1/Block_PIN, FMT_MTD.1/Resume_PIN, FMT_MTD.1/Initialize_PIN, FMT_MTD.1/Change_PIN, FMT_MTD.1/Unblock_PIN, FMT_MTD.1/Activate_PIN) also support achieving this objective. FDP_RIP.1 requires to erase the temporal values of the PIN and PUK.FIA_UAU.4/PACE, FIA_UAU.5/PACE, FIA_UAU.6/CA and FCS_CKM.4 represent some specific required properties of the used protocols.To allow for a verification of the certificate chain as required in FMT_MTD.3, the CVCA's public key and certificate, as well as the current date, are written or updated by authorized identified roles as required by FMT_MTD.1/CVCA_INI, FMT_MTD.1/CVCA_UPD and FMT_MTD.1/DATE.The SFRs FCS_COP.1/SHA and FCS_RND.1 represent the general required support for cryptographic operations.The SFRs FMT_SMF.1 and FMT_SMR.1/PACE support the related functions and roles.

OT.Data_Confidentiality The security objective OT.Data_Confidentiality ensures that the TOE always ensures confidentiality of the user- and TSF-Data stored and, after Terminal- and Chip Authentication 2, of their exchange.This objective for the data stored is mainly achieved by FDP_ACC.1/TRM and FDP_ACF.1/TRM. Enforcement of the two previous in a protected manner is ensured by FDP_UCT.1/TRM and FDP_UIT.1/TRM. A specific authorization level is achieved by terminal identification/authentication as required by the SFRs FIA_UID.1/EAC2_Terminal, FIA_UAU.1/EAC2_Terminal, supported by FCS_COP.1/SIG_VER. The TA2 protocol uses the result of the PACE authentication (FIA_UID.1/PACE, FIA_UAU.1/PACE, confidentiality of the PACE passwords is ensured by FMT_MTD.1/KEY_READ) being, in turn, supported by FCS_CKM.1/DH_PACE. Since PACE can use the PIN as the shared secret, the use and management of the PIN (FIA_AFL.1/Suspend_PIN, FIA_AFL.1/Block_PIN, FMT_MTD.1/Resume_PIN, FMT_MTD.1/Unblock_PIN, FMT_MTD.1/Change_PIN, FMT_MTD.1/Initialize_PIN, FMT_MTD.1/Activate_PIN) also support to achieve this objective. FDP_RIP.1 requires erasing the temporal values of the PIN and PUK.FIA_UAU.4/PACE, FIA_UAU.5/PACE, FIA_UAU.6/PACE and FCS_CKM.4 represent some specific properties of the used protocols.To allow for a verification of the certificate chain as required in FMT_MTD.3, the CVCA's public key and certificate as well as the current date are written or updated by authorized identified role as required by FMT_MTD.1/CVCA_INI, FMT_MTD.1/CVCA_UPD and FMT_MTD.1/DATE.This objective for the data exchanged is mainly achieved by FTP_ITC.1/CA2 and FTP_ITC.1/PACE using FCS_COP.1/PACE_ENC. A prerequisite for establishing this trusted channel is a successful Chip Authentication 2, cf. FIA_API.1/CA using FCS_CKM.1/DH_PACE and possessing the special properties FIA_UAU.5/PACE, and FIA_UAU.6/CA. As a prerequisite of this trusted channel, a trusted channel is established with the PACE protocol using FIA_UID.1/PACE, FIA_UAU.1/PACE and FCS_CKM.1/DH_PACE and possessing the special properties FIA_UAU.5/PACE, FIA_UAU.6/PACE. CA2 provides an evidence of possessing the Chip Authentication Private Key (SKPICC). FMT_MTD.1/SK_PICC governs creating/loading SKPICC, FMT_MTD.1/KEY_READ requires making this key unreadable by users. Thus its value remains confidential. FDP_RIP.1 requires erasing the values of SKPICC and session keys, here for KENC.FMT_MTD.1/PA requires that only the the personalization agent is allowed to modify the SOC (containing amongst other, the signature of PKPICC) used for Passive Authentication. The SFRs FCS_COP.1/SHA and FCS_RND.1 represent the general required support for cryptographic operations.The SFRs FMT_SMF.1 and FMT_SMR.1/PACE support the related functions and roles.

OT.Data_Integrity The security objective OT.Data_Integrity ensures that the TOE always ensures integrity of stored user- and TSF-Data and, after Terminal- and Chip Authentication 2, of these data exchanged (physical manipulation and unauthorized modifying). Physical manipulation is addressed by FPT_PHP.3.Unauthorized modifying of the stored data is addressed by FDP_ACC.1/TRM and FDP_ACF.1/TRM. Enforcement of the two previous in a protected manner is ensured by FDP_UCT.1/TRM and FDP_UIT.1/TRM. A specific authorization level is achieved by terminal identification/ authentication as required by the SFRs FIA_UID.1/EAC2_Terminal, FIA_UAU.1/EAC2_Terminal, supported by FCS_COP.1/SIG_VER. The TA2 protocol uses the result of PACE authentication (FIA_UID.1/PACE, FIA_UAU.1/PACE) being, in turn, supported by FCS_CKM.1/DH_PACE. Since PACE can use the PIN as the shared secret, using and management of PIN (FIA_AFL.1/Suspend_PIN, FIA_AFL.1/Block_PIN, FMT_MTD.1/Resume_PIN, FMT_MTD.1/Change_PIN, FMT_MTD.1/Unblock_PIN, FMT_MTD.1/Activate_PIN, FMT_MTD.1/Initialize_PIN) also support achievement of this objective. FDP_RIP.1 requires erasing the temporal values of PIN, PUK. FIA_UAU.4/PACE, FIA_UAU.5/PACE and FCS_CKM.4 represent some required specific properties of the used protocols.To allow for a verification of the certificate chain as required in FMT_MTD.3, the CVCA's public key and certificate as well as the current date are written or update by authorized identified role as required by FMT_MTD.1/CVCA_INI, FMT_MTD.1/CVCA_UPD and FMT_MTD.1/DATE.Unauthorized modifying of the exchanged data is addressed by FTP_ITC.1/CA2 and FTP_ITC.1/PACE using FCS_COP.1/PACE_MAC. A prerequisite for establishing this trusted channel is a successful Chip Authentication 2, cf. FIA_API.1/CA using FCS_CKM.1/DH_PACE possessing the special properties FIA_UAU.5/PACE and FIA_UAU.6/CA. As a prerequisite of this trusted channel a trusted channel established with the PACE protocol using FIA_UID.1/PACE, FIA_UAU.1/PACE and

FCS_CKM.1/DH_PACE and possessing the special properties FIA_UAU.5/PACE, FIA_UAU.6/PACE. CA2 provides an evidence of possessing the Chip Authentication Private Key (SKPICC). FMT_MTD.1/SK_PICC governs creating/loading SKPICC, and FMT_MTD.1/KEY_READ requires SKPICC to be unreadable by users; thus its value remains confidential. FDP_RIP.1 requires erasing the values of SKPICC and session keys (here: for KMAC).FMT_MTD.1/PA requires that the SOC (containing amongst other, the signature of PKPICC) used for Passive Authentication is allowed to be modified only by the personalization agent. Hence, is to considered as trustworthy.The SFRs FCS_COP.1/SHA and FCS_RND.1 represent general support required for cryptographic operations.The SFRs FMT_SMF.1 and FMT_SMR.1/PACE support related functions and roles.

OT.Identification The security objective OT.Identification addresses the storage of Initialisation and Pre-Personalisation Data in its non-volatile memory, whereby they also include the IC Identification Data uniquely identifying the TOE's chip. The SFR FMT_MTD.1/INI_ENA allows only the Manufacturer to write Initialisation and Pre-personalisation Data (including the Personalisation Agent key). The SFR FMT_MTD.1/INI_DIS requires the Personalisation Agent to disable access to Initialisation and Pre-personalisation Data in the life cycle phase 'operational use'.The SFRs FMT_SMF.1 and FMT_SMR.1/PACE support the functions and roles related.

OT.Prot_Abuse-Func The security objective OT.Prot_Abuse_Func aims preventing TOE's functions being not intended to be used in the operational phase from manipulating and disclosing the User- and TSF-data.This objective is achieved by FMT_LIM.1 and FMT_LIM.2 preventing misuse of test and other functionality of the TOE having not to be used in the TOE's operational life cycle phase.

OT.Prot_Inf_Leak The security objective OT.Prot_Inf_Leak aims protection against disclosure of confidential User- or/and TSF-data stored on / processed by the TOE. This objective is achieved

- by FPT_EMS.1 for measurement and analysis of the shape and amplitude of signals or the time between events found by measuring signals on the electromagnetic field, power consumption, clock, or I/O lines,
- by FPT_FLS.1 and FPT_TST.1 for forcing a malfunction of the TOE, and
- by FPT_PHP.3 for a physical manipulation of the TOE.

OT.Prot_Malfunction The security objective OT.Prot_Malfunction aims ensuring a correct operation of the TOE by preventing its operation outside the normal operating conditions.This objective is covered by FPT_TST.1 requiring self tests to demonstrate the correct operation of the TOE and tests of authorised users to verify the integrity of the TSF-data and the embedded software (TSF code) as well as by FPT_FLS.1 requiring entering a secure state of the TOE in case of detected failure or operating conditions possibly causing a malfunction.

OT.Prot_Phys-Tamper The security objective OT.Prot_Phys-Tamper aims protection of the confidentiality and integrity of the User- and TSF-data as well as embedded software stored in the TOE.This objective is completely covered by FPT_PHP.3 in an obvious way.

OT.Tracing The security objective OT.Tracing ensures that the TOE prevents gathering TOE tracing data by means of unambiguously identifying the electronic document remotely through establishing or listening to communication via the contactless/contact-based interface of the TOE without a priori knowledge of the correct values of shared passwords (CAN, MRZ, PIN, PUK).This objective is achieved as follows: 1.While establishing PACE communication with CAN, MRZ or PUK (non-blocking authentication / authorization data) by FIA_AFL.1/PACE while establishing PACE communication using the PIN (blocking authentication data) by FIA_AFL.1/Block_PIN 3.for listening to PACE communication and for establishing CA2 communication (which is of importance for the current PP, if Chip Security Object and PKPICC are card-individual) by FTP_ITC.1/PACE, 4.and for listening to CA2 communication (readable and writable user data: document details data, biographic data, biometric reference data) by FTP_ITC.1/CA2.

9.3.2 Rationale tables of Security Objectives and SFRs

Security Objectives	Security Functional Requirements	Rationale
OT.Tamper_Resistance	FPT_PHP.3	Section 9.3.1
OT.Tamper_ID	FPT_PHP.1	Section 9.3.1
OT.EMSEC_Design	FPT_EMS.1	Section 9.3.1
OT.DTBS_Integrity_TOE	FDP_SDI.2/DTBS	Section 9.3.1
OT.Sigy_SigF	FDP_ACF.1/Signature_Creation, FDP_ACC.1/Signature_Creation, FDP_RIP.1, FDP_SDI.2/DTBS, FIA_AFL.1, FIA_UAU.1, FIA_UID.1, FMT_MOF.1, FMT_MSA.1/Signatory, FMT_MSA.2, FMT_MSA.3, FMT_MSA.4, FMT_MTD.1/Admin, FMT_MTD.1/Signatory, FMT_SMR.1, FMT_SMF.1	Section 9.3.1
OT.Sig_Secure	FDP_SDI.2/Persistent, FPT_TST.1, FCS_COP.1	Section 9.3.1
OT.SCD_Secrecy	FCS_CKM.1, FCS_CKM.4, FDP_RIP.1, FDP_SDI.2/Persistent, FPT_FLS.1, FPT_PHP.3, FPT_TST.1, FPT_EMS.1, FDP_UCT.1/SCD, FTP_ITC.1/SCD	Section 9.3.1
OT.Lifecycle_Security	FCS_CKM.1, FCS_CKM.4, FDP_ACC.1/SCD/SVD_Generation,	Section 9.3.1

	FDP_ACF.1/SCD/SVD_Generation, FDP_ACC.1/SVD_Transfer, FDP_ACF.1/Signature_Creation, FDP_ACC.1/Signature_Creation, FDP_ACF.1/SVD_Transfer, FMT_MOF.1, FMT_MSA.1/Admin, FMT_MSA.1/Signatory, FMT_MSA.2, FMT_MSA.3, FMT_MSA.4, FMT_MTD.1/Admin, FMT_MTD.1/Signatory, FMT_SMR.1, FMT_SMF.1, FPT_TST.1, FCS_COP.1, FDP_ACC.1/SCD_Import, FDP_ACF.1/SCD_Import, FDP_ITC.1/SCD, FDP_UCT.1/SCD, FTP_ITC.1/SCD	
OT.SCD_SVD_Corresp	FCS_CKM.1, FDP_SDI.2/Persistent, FMT_MSA.4, FMT_SMF.1	Section 9.3.1
OT.SCD_Unique	FCS_CKM.1	Section 9.3.1
OT.SCD/SVD_Gen	FDP_ACC.1/SCD/SVD_Generation, FDP_ACF.1/SCD/SVD_Generation, FIA_UAU.1, FIA_UID.1, FMT_MSA.1/Admin, FMT_MSA.2, FMT_MSA.3, FMT_MSA.4	Section 9.3.1
OT.SCD_Auth_Imp	FIA_UID.1, FIA_UAU.1, FDP_ACC.1/SCD_Import, FDP_ACF.1/SCD_Import	Section 9.3.1
OT.TOE_SSCD_Auth	FIA_UAU.1, FIA_API.1	Section 9.3.1
OT.TOE_TC_SVD_Exp	FDP_ACF.1/SVD_Transfer, FDP_ACC.1/SVD_Transfer, FDP_DAU.2/SVD, FTP_ITC.1/SVD	Section 9.3.1
OT.TOE_TC_VAD_Imp	FTP_ITC.1/VAD	Section 9.3.1
OT.TOE_TC_DTBS_Imp	FDP_UIT.1/DTBS, FTP_ITC.1/DTBS	Section 9.3.1
OT.AC_Pers_EAC2	FIA_AFL.1/Suspend_PIN, FIA_AFL.1/Block_PIN, FIA_UAU.1/EAC2_Terminal, FIA_UID.1/EAC2_Terminal, FDP_ACF.1/TRM, FDP_RIP.1, FDP_ACC.1/TRM, FMT_SMF.1, FMT_SMR.1/PACE, FMT_MTD.1/PA, FMT_MTD.1/KEY_READ, FMT_MTD.1/Initialize_PIN, FMT_MTD.1/Resume_PIN, FMT_MTD.1/Change_PIN, FMT_MTD.1/Unblock_PIN, FMT_MTD.1/INI_ENA, FMT_MTD.1/INI_DIS	Section 9.3.1
OT.CA2	FCS_CKM.1/DH_PACE, FCS_COP.1/SHA, FCS_COP.1/PACE_MAC, FCS_RND.1, FIA_API.1/CA, FDP_RIP.1, FMT_MTD.1/PA, FMT_MTD.1/SK_PICC, FMT_MTD.1/KEY_READ	Section 9.3.1
OT.Sens_Data_EAC2	FTP_ITC.1/CA2, FCS_RND.1, FCS_CKM.1/DH_PACE, FCS_COP.1/SHA, FCS_COP.1/SIG_VER, FCS_COP.1/PACE_ENC,	Section 9.3.1

	FIA_UAU.1/PACE, FIA_UAU.5/PACE, FIA_AFL.1/Suspend_PIN, FIA_AFL.1/Block_PIN, FIA_UAU.1/EAC2_Terminal, FIA_API.1/CA, FIA_UAU.6/CA, FIA_UID.1/PACE, FIA_UID.1/EAC2_Terminal, FIA_UAU.4/PACE, FIA_UAU.6/PACE, FDP_ACF.1/TRM, FDP_ACC.1/TRM, FDP_UCT.1/TRM, FDP_UIT.1/TRM, FTP_ITC.1/PACE, FMT_SMR.1/PACE, FMT_MTD.1/CVCA_INI, FMT_MTD.1/CVCA_UPD, FMT_MTD.1/DATE, FMT_MTD.1/PA, FMT_MTD.1/SK_PICC, FMT_MTD.1/KEY_READ, FMT_MTD.1/Initialize_PIN, FMT_MTD.1/Resume_PIN, FMT_MTD.1/Change_PIN, FMT_MTD.1/Unblock_PIN, FMT_MTD.3, FMT_SMF.1, FCS_CKM.4, FDP_RIP.1	
OT.Data_Authenticity	FTP_ITC.1/CA2, FCS_RND.1, FCS_CKM.1/DH_PACE, FCS_COP.1/SHA, FCS_COP.1/SIG_VER, FCS_COP.1/PACE_MAC, FIA_UAU.1/PACE, FIA_UAU.5/PACE, FIA_AFL.1/Suspend_PIN, FIA_AFL.1/Block_PIN, FIA_UAU.1/EAC2_Terminal, FIA_API.1/CA, FIA_UAU.6/CA, FIA_UID.1/PACE, FIA_UID.1/EAC2_Terminal, FIA_UAU.4/PACE, FIA_UAU.6/PACE, FTP_ITC.1/PACE, FMT_SMR.1/PACE, FMT_MTD.1/CVCA_INI, FMT_MTD.1/CVCA_UPD, FMT_MTD.1/DATE, FMT_MTD.1/PA, FMT_MTD.1/SK_PICC, FMT_MTD.1/KEY_READ, FMT_MTD.1/Initialize_PIN, FMT_MTD.1/Resume_PIN, FMT_MTD.1/Change_PIN, FMT_MTD.1/Unblock_PIN, FMT_MTD.3, FMT_SMF.1, FCS_CKM.4, FDP_RIP.1	Section 9.3.1
OT.Data_Confidentiality	FTP_ITC.1/CA2, FCS_RND.1, FCS_CKM.1/DH_PACE, FCS_COP.1/SHA, FCS_COP.1/SIG_VER, FCS_COP.1/PACE_ENC, FIA_UAU.1/PACE, FIA_UAU.5/PACE, FIA_AFL.1/Suspend_PIN, FIA_AFL.1/Block_PIN, FIA_UAU.1/EAC2_Terminal, FIA_API.1/CA, FIA_UAU.6/CA, FIA_UID.1/PACE, FIA_UID.1/EAC2_Terminal, FIA_UAU.4/PACE, FIA_UAU.6/PACE, FDP_ACF.1/TRM, FDP_ACC.1/TRM, FDP_UCT.1/TRM, FDP_UIT.1/TRM, FTP_ITC.1/PACE, FMT_SMR.1/PACE, FMT_MTD.1/CVCA_INI, FMT_MTD.1/CVCA_UPD, FMT_MTD.1/DATE, FMT_MTD.1/PA, FMT_MTD.1/SK_PICC, FMT_MTD.1/KEY_READ,	Section 9.3.1

	FMT_MTD.1/Initialize_PIN, FMT_MTD.1/Resume_PIN, FMT_MTD.1/Change_PIN, FMT_MTD.1/Unblock_PIN, FMT_MTD.3, FMT_SMF.1, FCS_CKM.4, FDP_RIP.1	
OT.Data_Integrity	FTP_ITC.1/CA2, FCS_RND.1, FCS_CKM.1/DH_PACE, FCS_COP.1/SHA, FCS_COP.1/SIG_VER, FCS_COP.1/PACE_MAC, FIA_UAU.1/PACE, FIA_UAU.5/PACE, FIA_AFL.1/Suspend_PIN, FIA_AFL.1/Block_PIN, FIA_UAU.1/EAC2_Terminal, FIA_API.1/CA, FIA_UAU.6/CA, FIA_UID.1/PACE, FIA_UID.1/EAC2_Terminal, FIA_UAU.4/PACE, FIA_UAU.6/PACE, FDP_ACF.1/TRM, FDP_ACC.1/TRM, FDP_UCT.1/TRM, FDP_UIT.1/TRM, FTP_ITC.1/PACE, FMT_SMR.1/PACE, FMT_MTD.1/CVCA_INI, FMT_MTD.1/CVCA_UPD, FMT_MTD.1/DATE, FMT_MTD.1/PA, FMT_MTD.1/SK_PICC, FMT_MTD.1/KEY_READ, FMT_MTD.1/Initialize_PIN, FMT_MTD.1/Resume_PIN, FMT_MTD.1/Change_PIN, FMT_MTD.1/Unblock_PIN, FMT_MTD.3, FPT_PHP.3, FMT_SMF.1, FCS_CKM.4, FDP_RIP.1	Section 9.3.1
OT.Identification	FMT_SMF.1, FMT_SMR.1/PACE, FMT_MTD.1/INI_ENA, FMT_MTD.1/INI_DIS	Section 9.3.1
OT.Prot_Abuse-Func	FMT_LIM.1, FMT_LIM.2	Section 9.3.1
OT.Prot_Inf_Leak	FPT_FLS.1, FPT_TST.1, FPT_PHP.3, FPT_EMS.1	Section 9.3.1
OT.Prot_Malfunction	FPT_FLS.1, FPT_TST.1	Section 9.3.1
OT.Prot_Phys-Tamper	FPT_PHP.3	Section 9.3.1
OT.Tracing	FIA_AFL.1/Block_PIN, FIA_AFL.1/PACE, FTP_ITC.1/CA2, FTP_ITC.1/PACE	Section 9.3.1

Table 10 Security Objectives and SFRs - Coverage

Security Functional Requirements	Security Objectives	Rationale
FPT_EMS.1	OT.EMSEC_Design, OT.SCD_Secrecy, OT.Prot_Inf_Leak	
FPT_FLS.1	OT.SCD_Secrecy, OT.Prot_Inf_Leak, OT.Prot_Malfunction	
FPT_PHP.1	OT.Tamper_ID	
FPT_PHP.3	OT.Tamper_Resistance, OT.SCD_Secrecy,	

	OT.Data_Integrity, OT.Prot_Inf_Leak, OT.Prot_Phys-Tamper	
FPT_TST.1	OT.Sig_Secure, OT.SCD_Secrecy, OT.Lifecycle_Security, OT.Prot_Inf_Leak, OT.Prot_Malfunction	
FMT_SMR.1	OT.Sigy_SigF, OT.Lifecycle_Security	
FMT_SMF.1	OT.Sigy_SigF, OT.Lifecycle_Security, OT.SCD_SVD_Corresp, OT.AC_Pers_EAC2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity, OT.Identification	
FMT_MOF.1	OT.Sigy_SigF, OT.Lifecycle_Security	
FMT_MSA.1/Admin	OT.Lifecycle_Security, OT.SCD/SVD_Gen	
FMT_MSA.1/Signatory	OT.Sigy_SigF, OT.Lifecycle_Security	
FMT_MSA.2	OT.Sigy_SigF, OT.Lifecycle_Security, OT.SCD/SVD_Gen	
FMT_MSA.3	OT.Sigy_SigF, OT.Lifecycle_Security, OT.SCD/SVD_Gen	
FMT_MSA.4	OT.Sigy_SigF, OT.Lifecycle_Security, OT.SCD_SVD_Corresp, OT.SCD/SVD_Gen	
FMT_MTD.1/Admin	OT.Sigy_SigF, OT.Lifecycle_Security	
FMT_MTD.1/Signatory	OT.Sigy_SigF, OT.Lifecycle_Security	
FIA_UID.1	OT.Sigy_SigF, OT.SCD/SVD_Gen, OT.SCD_Auth_Imp	
FIA_AFL.1	OT.Sigy_SigF	
FIA_UAU.1	OT.Sigy_SigF, OT.SCD/SVD_Gen, OT.SCD_Auth_Imp, OT.TOE_SSCD_Auth	
FDP_SDI.2/DTBS	OT.DTBS_Integrity_TOE, OT.Sigy_SigF	
FDP_SDI.2/Persistent	OT.Sig_Secure, OT.SCD_Secrecy, OT.SCD_SVD_Corresp	
FDP_RIP.1	OT.Sigy_SigF, OT.SCD_Secrecy, OT.AC_Pers_EAC2, OT.CA2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FDP_ACC.1/Signature_Creation	OT.Sigy_SigF, OT.Lifecycle_Security	
FDP_ACF.1/Signature_Creation	OT.Sigy_SigF, OT.Lifecycle_Security	
FCS_COP.1	OT.Sig_Secure, OT.Lifecycle_Security	
FCS_CKM.4	OT.SCD_Secrecy, OT.Lifecycle_Security, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	

FCS_CKM.1	OT.SCD_Secrecy, OT.Lifecycle_Security, OT.SCD_SVD_Corresp, OT.SCD_Unique	
FDP_ACC.1/SVD_Transfer	OT.Lifecycle_Security, OT.TOE_TC_SVD_Exp	
FDP_ACF.1/SVD_Transfer	OT.Lifecycle_Security, OT.TOE_TC_SVD_Exp	
FDP_ACC.1/SCD/SVD_Generation	OT.Lifecycle_Security, OT.SCD/SVD_Gen	
FDP_ACF.1/SCD/SVD_Generation	OT.Lifecycle_Security, OT.SCD/SVD_Gen	
FTP_ITC.1/SCD	OT.SCD_Secrecy, OT.Lifecycle_Security	
FDP_UCT.1/SCD	OT.SCD_Secrecy, OT.Lifecycle_Security	
FDP_ITC.1/SCD	OT.Lifecycle_Security	
FDP_ACC.1/SCD_Import	OT.Lifecycle_Security, OT.SCD_Auth_Imp	
FDP_ACF.1/SCD_Import	OT.Lifecycle_Security, OT.SCD_Auth_Imp	
FTP_ITC.1/SVD	OT.TOE_TC_SVD_Exp	
FDP_DAU.2/SVD	OT.TOE_TC_SVD_Exp	
FIA_API.1	OT.TOE_SSCD_Auth	
FDP_UIT.1/DTBS	OT.TOE_TC_DTBS_Imp	
FTP_ITC.1/VAD	OT.TOE_TC_VAD_Imp	
FTP_ITC.1/DTBS	OT.TOE_TC_DTBS_Imp	
FCS_RND.1	OT.CA2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FCS_CKM.1/DH_PACE	OT.CA2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FCS_COP.1/SHA	OT.CA2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FCS_COP.1/SIG_VER	OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FCS_COP.1/PACE_ENC	OT.Sens_Data_EAC2, OT.Data_Confidentiality	
FCS_COP.1/PACE_MAC	OT.CA2, OT.Data_Authenticity, OT.Data_Integrity	
FIA_UAU.1/PACE	OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FIA_UAU.5/PACE	OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FIA_AFL.1/Suspend_PIN	OT.AC_Pers_EAC2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	

FIA_AFL.1/Block_PIN	OT.AC_Pers_EAC2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity, OT.Tracing	
FIA_AFL.1/PACE	OT.Tracing	
FIA_UAU.1/EAC2_Terminal	OT.AC_Pers_EAC2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FIA_API.1/CA	OT.CA2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FIA_UAU.6/CA	OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FIA_UID.1/PACE	OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FIA_UID.1/EAC2_Terminal	OT.AC_Pers_EAC2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FIA_UAU.4/PACE	OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FIA_UAU.6/PACE	OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FDP_ACF.1/TRM	OT.AC_Pers_EAC2, OT.Sens_Data_EAC2, OT.Data_Confidentiality, OT.Data_Integrity	
FDP_ACC.1/TRM	OT.AC_Pers_EAC2, OT.Sens_Data_EAC2, OT.Data_Confidentiality, OT.Data_Integrity	
FDP_UCT.1/TRM	OT.Sens_Data_EAC2, OT.Data_Confidentiality, OT.Data_Integrity	
FDP_UIT.1/TRM	OT.Sens_Data_EAC2, OT.Data_Confidentiality, OT.Data_Integrity	
FTP_ITC.1/PACE	OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity, OT.Tracing	
FMT_SMR.1/PACE	OT.AC_Pers_EAC2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity, OT.Identification	
FMT_MTD.1/CVCA_INI	OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FMT_MTD.1/CVCA_UPD	OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FMT_MTD.1/DATE	OT.Sens_Data_EAC2, OT.Data_Authenticity,	

	OT.Data_Confidentiality, OT.Data_Integrity	
FMT_MTD.1/PA	OT.AC_Pers_EAC2, OT.CA2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FMT_MTD.1/SK_PICC	OT.CA2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FMT_MTD.1/KEY_READ	OT.AC_Pers_EAC2, OT.CA2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FMT_MTD.1/Initialize_PIN	OT.AC_Pers_EAC2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FMT_MTD.1/Resume_PIN	OT.AC_Pers_EAC2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FMT_MTD.1/Change_PIN	OT.AC_Pers_EAC2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FMT_MTD.1/Unblock_PIN	OT.AC_Pers_EAC2, OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FMT_MTD.3	OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity	
FMT_MTD.1/INI_ENA	OT.AC_Pers_EAC2, OT.Identification	
FMT_MTD.1/INI_DIS	OT.AC_Pers_EAC2, OT.Identification	
FTP_ITC.1/CA2	OT.Sens_Data_EAC2, OT.Data_Authenticity, OT.Data_Confidentiality, OT.Data_Integrity, OT.Tracing	
FMT_LIM.1	OT.Prot_Abuse-Func	
FMT_LIM.2	OT.Prot_Abuse-Func	

Table 11 SFRs and Security Objectives

9.3.3 Dependencies

9.3.3.1 SFRs Dependencies

Requirements	CC Dependencies	Satisfied Dependencies
FCS_RND.1	No Dependencies	
FCS_CKM.1/DH_PACE	(FCS_CKM.2 or FCS_COP.1) and (FCS_CKM.4)	FCS_COP.1, FCS_CKM.4
FCS_COP.1/SHA	(FCS_CKM.1 or FDP_ITC.1 or FDP_ITC.2) and (FCS_CKM.4)	FCS_CKM.4, FCS_CKM.1
FCS_COP.1/SIG_VER	(FCS_CKM.1 or FDP_ITC.1 or FDP_ITC.2) and (FCS_CKM.4)	FCS_CKM.4, FCS_CKM.1
FCS_COP.1/PACE_ENC	(FCS_CKM.1 or FDP_ITC.1 or FDP_ITC.2) and (FCS_CKM.4)	FCS_CKM.1/DH_PACE, FCS_CKM.4
FCS_COP.1/PACE_MAC	(FCS_CKM.1 or FDP_ITC.1 or FDP_ITC.2) and (FCS_CKM.4)	FCS_CKM.1/DH_PACE, FCS_CKM.4
FIA_UAU.1/PACE	(FIA_UID.1)	FIA_UID.1/PACE
FIA_UAU.5/PACE	No Dependencies	
FIA_AFL.1/Suspend_PIN	(FIA_UAU.1)	FIA_UAU.1/PACE
FIA_AFL.1/Block_PIN	(FIA_UAU.1)	FIA_UAU.1/PACE
FIA_AFL.1/PACE	(FIA_UAU.1)	FIA_UAU.1/PACE
FIA_UAU.1/EAC2_Terminal	(FIA_UID.1)	FIA_UID.1/EAC2_Terminal
FIA_API.1/CA	No Dependencies	
FIA_UAU.6/CA	No Dependencies	
FIA_UID.1/PACE	No Dependencies	
FIA_UID.1/EAC2_Terminal	No Dependencies	
FIA_UAU.4/PACE	No Dependencies	
FIA_UAU.6/PACE	No Dependencies	
FDP_ACF.1/TRM	(FDP_ACC.1) and (FMT_MSA.3)	FDP_ACC.1/TRM
FDP_ACC.1/TRM	(FDP_ACF.1)	FDP_ACF.1/TRM
FDP_UCT.1/TRM	(FDP_ACC.1 or	FDP_ACC.1/TRM, FTP_ITC.1/PACE

	FDP_IFC.1) and (FTP_ITC.1 or FTP_TRP.1)	
FDP_UIT.1/TRM	(FDP_ACC.1 or FDP_IFC.1) and (FTP_ITC.1 or FTP_TRP.1)	FDP_ACC.1/TRM, FTP_ITC.1/PACE
FTP_ITC.1/PACE	No Dependencies	
FMT_SMR.1/PACE	(FIA_UID.1)	FIA_UID.1/PACE, FIA_UID.1/EAC2_Terminal
FMT_MTD.1/CVCA_INI	(FMT_SMF.1) and (FMT_SMR.1)	FMT_SMR.1/PACE, FMT_SMF.1
FMT_MTD.1/CVCA_UPD	(FMT_SMF.1) and (FMT_SMR.1)	FMT_SMR.1/PACE, FMT_SMF.1
FMT_MTD.1/DATE	(FMT_SMF.1) and (FMT_SMR.1)	FMT_SMR.1/PACE, FMT_SMF.1
FMT_MTD.1/PA	(FMT_SMF.1) and (FMT_SMR.1)	FMT_SMR.1/PACE, FMT_SMF.1
FMT_MTD.1/SK_PICC	(FMT_SMF.1) and (FMT_SMR.1)	FMT_SMR.1/PACE, FMT_SMF.1
FMT_MTD.1/KEY_READ	(FMT_SMF.1) and (FMT_SMR.1)	FMT_SMR.1/PACE, FMT_SMF.1
FMT_MTD.1/Initialize_PIN	(FMT_SMF.1) and (FMT_SMR.1)	FMT_SMR.1/PACE, FMT_SMF.1
FMT_MTD.1/Resume_PIN	(FMT_SMF.1) and (FMT_SMR.1)	FMT_SMR.1/PACE, FMT_SMF.1
FMT_MTD.1/Change_PIN	(FMT_SMF.1) and (FMT_SMR.1)	FMT_SMR.1/PACE, FMT_SMF.1
FMT_MTD.1/Unblock_PIN	(FMT_SMF.1) and (FMT_SMR.1)	FMT_SMR.1/PACE, FMT_SMF.1
FMT_MTD.3	(FMT_MTD.1)	FMT_MTD.1/CVCA_INI, FMT_MTD.1/CVCA_UPD, FMT_MTD.1/DATE
FMT_MTD.1/INI_ENA	(FMT_SMF.1) and (FMT_SMR.1)	FMT_SMR.1/PACE, FMT_SMF.1
FMT_MTD.1/INI_DIS	(FMT_SMF.1) and (FMT_SMR.1)	FMT_SMR.1/PACE, FMT_SMF.1
FTP_ITC.1/CA2	No Dependencies	
FMT_LIM.1	No Dependencies	
FMT_LIM.2	No Dependencies	
FPT_EMS.1	No Dependencies	

FPT_FLS.1	No Dependencies	
FPT_PHP.1	No Dependencies	
FPT_PHP.3	No Dependencies	
FPT_TST.1	No Dependencies	
FMT_SMR.1	(FIA_UID.1)	FIA_UID.1
FMT_SMF.1	No Dependencies	
FMT_MOF.1	(FMT_SMF.1) and (FMT_SMR.1)	FMT_SMR.1, FMT_SMF.1
FMT_MSA.1/Admin	(FDP_ACC.1 or FDP_IFC.1) and (FMT_SMF.1) and (FMT_SMR.1)	FMT_SMR.1, FMT_SMF.1, FDP_ACC.1/Signature_Creation, FDP_ACC.1/SVD_Transfer, FDP_ACC.1/SCD/SVD_Generation, FDP_ACC.1/SCD_Import
FMT_MSA.1/Signatory	(FDP_ACC.1 or FDP_IFC.1) and (FMT_SMF.1) and (FMT_SMR.1)	FMT_SMR.1, FMT_SMF.1, FDP_ACC.1/Signature_Creation
FMT_MSA.2	(FDP_ACC.1 or FDP_IFC.1) and (FMT_MSA.1) and (FMT_SMR.1)	FMT_SMR.1, FMT_MSA.1/Admin, FMT_MSA.1/Signatory, FDP_ACC.1/Signature_Creation, FDP_ACC.1/SCD/SVD_Generation
FMT_MSA.3	(FMT_MSA.1) and (FMT_SMR.1)	FMT_SMR.1, FMT_MSA.1/Admin, FMT_MSA.1/Signatory
FMT_MSA.4	(FDP_ACC.1 or FDP_IFC.1)	FDP_ACC.1/Signature_Creation, FDP_ACC.1/SCD/SVD_Generation
FMT_MTD.1/Admin	(FMT_SMF.1) and (FMT_SMR.1)	FMT_SMR.1, FMT_SMF.1
FMT_MTD.1/Signatory	(FMT_SMF.1) and (FMT_SMR.1)	FMT_SMR.1, FMT_SMF.1
FIA_UID.1	No Dependencies	
FIA_AFL.1	(FIA_UAU.1)	FIA_UAU.1
FIA_UAU.1	(FIA_UID.1)	FIA_UID.1
FDP_SDI.2/DTBS	No Dependencies	
FDP_SDI.2/Persistent	No Dependencies	
FDP_RIP.1	No Dependencies	
FDP_ACC.1/Signature_Creation	(FDP_ACF.1)	FDP_ACF.1/Signature_Creation
FDP_ACF.1/Signature_Creation	(FDP_ACC.1) and (FMT_MSA.3)	FMT_MSA.3, FDP_ACC.1/Signature_Creation
FCS_COP.1	(FCS_CKM.1 or FDP_ITC.1 or	FCS_CKM.4, FCS_CKM.1, FDP_ITC.1/SCD

	FDP_ITC.2) and (FCS_CKM.4)	
FCS_CKM.4	(FCS_CKM.1 or FDP_ITC.1 or FDP_ITC.2)	FCS_CKM.1, FDP_ITC.1/SCD
FCS_CKM.1	(FCS_CKM.2 or FCS_COP.1) and (FCS_CKM.4)	FCS_COP.1, FCS_CKM.4
FDP_ACC.1/SVD_Transfer	(FDP_ACF.1)	FDP_ACF.1/SVD_Transfer
FDP_ACF.1/SVD_Transfer	(FDP_ACC.1) and (FMT_MSA.3)	FMT_MSA.3, FDP_ACC.1/SVD_Transfer
FDP_ACC.1/SCD/SVD_Generation	(FDP_ACF.1)	FDP_ACF.1/SCD/SVD_Generation
FDP_ACF.1/SCD/SVD_Generation	(FDP_ACC.1) and (FMT_MSA.3)	FMT_MSA.3, FDP_ACC.1/SCD/SVD_Generation
FTP_ITC.1/SCD	No Dependencies	
FDP_UCT.1/SCD	(FDP_ACC.1 or FDP_IFC.1) and (FTP_ITC.1 or FTP_TRP.1)	FTP_ITC.1/SCD, FDP_ACC.1/SCD_Import
FDP_ITC.1/SCD	(FDP_ACC.1 or FDP_IFC.1) and (FMT_MSA.3)	FMT_MSA.3, FDP_ACC.1/SCD_Import
FDP_ACC.1/SCD_Import	(FDP_ACF.1)	FDP_ACF.1/SCD_Import
FDP_ACF.1/SCD_Import	(FDP_ACC.1) and (FMT_MSA.3)	FMT_MSA.3, FDP_ACC.1/SCD_Import
FTP_ITC.1/SVD	No Dependencies	
FDP_DAU.2/SVD	(FIA_UID.1)	FIA_UID.1
FIA_API.1	No Dependencies	
FDP_UIT.1/DTBS	(FDP_ACC.1 or FDP_IFC.1) and (FTP_ITC.1 or FTP_TRP.1)	FDP_ACC.1/Signature_Creation, FTP_ITC.1/DTBS
FTP_ITC.1/VAD	No Dependencies	
FTP_ITC.1/DTBS	No Dependencies	

Table 12 SFRs Dependencies

Rationale for the exclusion of Dependencies

The dependency FMT_MSA.3 of FDP_ACF.1/TRM is discarded. The access control TSF according to FDP_ACF.1/TRM uses security attributes that have been defined during personalization, and that are fixed over the whole life time of the TOE. No management of these security attributes (i.e. SFR FMT_MSA.1 and FMT_MSA.3) is necessary.

9.3.3.2 SARs Dependencies

Requirements	CC Dependencies	Satisfied Dependencies
ADV_ARC.1	(ADV_FSP.1) and (ADV_TDS.1)	ADV_FSP.5, ADV_TDS.4
ADV_FSP.5	(ADV_IMP.1) and (ADV_TDS.1)	ADV_IMP.1, ADV_TDS.4
ADV_IMP.1	(ADV_TDS.3) and (ALC_TAT.1)	ADV_TDS.4, ALC_TAT.2
ADV_TDS.4	(ADV_FSP.5)	ADV_FSP.5
ADV_INT.2	(ADV_IMP.1) and (ADV_TDS.3) and (ALC_TAT.1)	ADV_IMP.1, ADV_TDS.4, ALC_TAT.2
AGD_OPE.1	(ADV_FSP.1)	ADV_FSP.5
AGD_PRE.1	No Dependencies	
ALC_CMC.4	(ALC_CMS.1) and (ALC_DVS.1) and (ALC_LCD.1)	ALC_CMS.5, ALC_DVS.2, ALC_LCD.1
ALC_CMS.5	No Dependencies	
ALC_DEL.1	No Dependencies	
ALC_DVS.2	No Dependencies	
ALC_LCD.1	No Dependencies	
ALC_TAT.2	(ADV_IMP.1)	ADV_IMP.1
ASE_CCL.1	(ASE_ECD.1) and (ASE_INT.1) and (ASE_REQ.1)	ASE_ECD.1, ASE_INT.1, ASE_REQ.2
ASE_ECD.1	No Dependencies	
ASE_INT.1	No Dependencies	
ASE_OBJ.2	(ASE_SPD.1)	ASE_SPD.1
ASE_REQ.2	(ASE_ECD.1) and (ASE_OBJ.2)	ASE_ECD.1, ASE_OBJ.2
ASE_SPD.1	No Dependencies	
ASE_TSS.1	(ADV_FSP.1) and (ASE_INT.1) and (ASE_REQ.1)	ADV_FSP.5, ASE_INT.1, ASE_REQ.2
ATE_COV.2	(ADV_FSP.2) and (ATE_FUN.1)	ADV_FSP.5, ATE_FUN.1
ATE_DPT.3	(ADV_ARC.1) and (ADV_TDS.4) and (ATE_FUN.1)	ADV_ARC.1, ADV_TDS.4, ATE_FUN.1
ATE_FUN.1	(ATE_COV.1)	ATE_COV.2
ATE_IND.2	(ADV_FSP.2) and (AGD_OPE.1) and	ADV_FSP.5, AGD_OPE.1,

	(AGD_PRE.1) and (ATE_COV.1) and (ATE_FUN.1)	AGD_PRE.1, ATE_COV.2, ATE_FUN.1
AVA_VAN.5	(ADV_ARC.1) and (ADV_FSP.4) and (ADV_IMP.1) and (ADV_TDS.3) and (AGD_OPE.1) and (AGD_PRE.1) and (ATE_DPT.1)	ADV_ARC.1, ADV_FSP.5, ADV_IMP.1, ADV_TDS.4, AGD_OPE.1, AGD_PRE.1, ATE_DPT.3

Table 13 SARs Dependencies

9.3.4 Rationale for the Security Assurance Requirements

The assurance level for this Security Traget is EAL4 augmented. EAL4 allows a developer to attain a reasonably high assurance level without the need for highly specialized processes and practices. It is considered to be the highest level that could be applied to an existing product line without undue expense and complexity. As such, EAL4 is appropriate for commercial products that can be applied to moderate to high security functions. Augmentation results from the selection of:

AVA_VAN.5 Advanced methodical vulnerability analysis

9.3.5 AVA_VAN.5 Advanced methodical vulnerability analysis

The TOE is intended to function in a variety of signature creation systems for qualified electronic signatures. Due to the nature of its intended application, i.e., the TOE may be issued to users and may not be directly under the control of trained and dedicated administrators. As a result, it is imperative that misleading, unreasonable and conflicting guidance is absent from the guidance documentation, and that secure procedures for all modes of operation have been addressed. Insecure states should be easy to detect. The TOE shall be shown to be highly resistant to penetration attacks to meet the security objectives OT.SCD_Secrecy, OT.Sigy_SigF and OT.Sig_Secure.

9.3.6 ALC_DVS.2 Sufficiency of security measures

Development security is concerned with physical, procedural, personnel and other technical measures that may be used in the development environment to protect the TOE. Due to the nature of the TOE, there is a need to justify the sufficiency of these procedures to protect the confidentiality and the integrity of the TOE. The TOE shall be protected in confidentiality and integrity during its development to meet the security objective OT.Lifecycle_Security.

10 TOE Summary Specification

10.1 TOE Summary Specification

This section provides a summary of the security functions implemented by the TOE in order to fulfil the security functional requirements. The summary is structured in security functions.

The security functionalities concerning the IC and the JC Platform are described in [ST-IC], [ST-PL] and are not redefined in this security target, although they must be considered for the TOE.

10.1.1 Chip security functionalities

The full list of the IC Platform security functionalities can be checked in the IC Platform Security Target [ST-IC].

10.1.2 Platform security functionalities

The full list of the JC Platform security functionalities can be checked in the JC Platform Security Target [ST-PL].

10.1.3 Application security functionalities

SF.AUTHENTICATION

Only authenticated terminals can get access to the user data stored on the TOE. The ID.me applet offers several authentication schemes enabling to authenticate different roles, such as:

- The signatory entitled to use the services offered by the card. It is called "User Authentication".
- The device communicating with the card, to establish a trusted channel (secure messaging) and protect the communication. It is called "Device authentication".
- The administrator of a service, to administrate some features. It is called "Role authentication".

The **User authentication** is based on the submission of a PIN/password (i.e., knowledge based) or a biometric template (i.e., biometry based).

- Knowledge based: The Authentication of the user relies on a shared secret (PIN), known by both the holder and the smartcard. The Card holder is authenticated by the means of the VERIFY command. For each SCD separate signatory's RADs (PINs) are assigned. The verification process uses a velocity checking mechanism, thus a remaining tries counter and a maximum error counter are defined for each PIN. If the verification fails, the tries counter is decremented by one and an error status that contains the remaining attempts is returned by the application. When all available tries have failed, the PIN is blocked and can no longer be used. Note that a successful verification of the PIN resets its remaining tries counter to the maximum error counter.

- Biometry based: The most known biometric kind is the "Fingerprint" or the "Facial recognition". Instead of storing a number for the PIN, the card will store the reference template of the biometry that will be used for the verification.

The **Device Authentication** aims at authenticating both entities willing to communicate and securing the communication between the card and a service provider (it might be a terminal, a server, etc).

- Authentication Scheme: The smart card implements a mutual authentication scheme. This one relies either on 3DES or AES Cipher block and used to:
  - Authenticate the terminal and the card.
  - Generate two temporary keys that will be further used to compute session keys for the secure messaging in the subsequent commands.
  - Initialize the counter used at each checksum computation.
- PACE Authentication: PACE establishes Secure Messaging between the ID.me application and a terminal based on weak (short) passwords:
  - Strong session keys are provided independent of the strength of the password.
  - The entropy of the password(s) used to authenticate the terminal can be very low (e.g. 6 digits are sufficient in general).

  The detailed specification of the PACE protocol can be found in [ICAO-9303]. As opposed to the original context in which PACE is used, i.e., before the application selection, the ID.me application simply considers the PACE protocol as another way to initiate secure messaging with the terminal. In other words, PACE is an access condition that may or may not be required to read or write an object in the file system.
- EAC2 as defined in [TR-03110-2] which consists of two parts:
  - Chip Authentication aims at authenticating the chip and initiates a secure communication channel to communicate. The protocol in Version 2 provides explicit authentication of the chip by verifying the authentication token and implicit authentication of the stored data by performing Secure Messaging using the new session keys.
  - Terminal Authentication protocol uses the secure messaging established by the Chip Authentication Mechanism to protect the confidentiality and integrity of the sensitive data during their transmission from the TOE to the terminal. Therefore, Terminal Authentication can only be performed if Chip Authentication has been successfully executed.

The **Role Authentication** presents the procedure to authenticate an external entity to the card in order to associate to it a specific role (e.g. access rights). Two schemes may be used, relying either on 3DES, AES or RSA Cipher block. The following procedure describes:

- The cryptographic operation that allows the authentication
- The specification of the associated role in the card. This feature is described in [D14890-2], §7.3.

In ID.me, the Access conditions "Secure Messaging" mandates both a successful terminal authentication and an active secure messaging session. This security function manages authentication failure: when the "highest value in the configurable range of positive numbers fixed by the Administrator" unsuccessful authentication attempts have been met, the TSF shall block the RAD. This security functionality allows the following operations to be performed before the user is authenticated:

- Identification of the user,
- Establishing a trusted path between the HID and the TOE,
- Establishing a trusted channel between the SCA and the TOE,
- Establishing a trusted channel between the CGA and the TOE.

SF.APP_CRYPTO

This SF performs high level cryptographic operations:

- key generation:
  - SF.APP_CRYPTO performs RSA key generation of size 1024, 1536, 2048, 2560, 3072 and 4096 bits in conformance with RSA PKCS1 v2.1. Key generation is performed based on random numbers generated by a deterministic RNG,
  - SF.APP_CRYPTO performs Elliptic curves key generation of size 192,224,256, 320, 384,512 and 521 bits in conformance with ANS X9.62.
  - SF.APP_CRYPTO performs TDES and AES key generation.
- Digital signature generation:
  - the signature generation function shall have an access condition based upon previous authentication of user.
  - signature generation by using ECDSA algorithm with cryptographic key sizes of 192,224,256, 320, 384,512 and 521 (provided by the cryptographic library of the Platform).
  - signature generation by using RSA algorithm with cryptographic key sizes of 1024, 1536, 2048, 2560 and 4096 bits (provided by Platform).
- SCD/SVD key pair consistency check: SF.APP_CRYPTO performs SCD/SVD consistency check before signature generation by signature generation followed by signature verification. If the signature verification does not match the signature generation, then the key pair is not consistent.
- Encryption/decryption: SF.APP_CRYPTO performs TDES and AES in order to achieve encryption and decryption in secure messaging.
- Integrity verification: SF.APP_CRYPTO performs ISO/IEC 9797-1 algorithm 3 padding 2 (3DES) or CMAC (AES) in order to achieve message authentication code in secure messaging.
- Authentication cryptogram creation/verification: SF.APP_CRYPTO performs the following authentication cryptogram calculation/verification:
  - Mutual authentication based on TDES or AES
  - PACE authentication based on [ICAO-9303]
- Random number generation that meet Class PTG.2 according to AIS31 provided by the Platform (e.g. for PACE authentication mechanism).
- Data Hashing: SF.APP_CRYPTO performs SHA-1, SHA-224, SHA-256, SHA-384 and SHA-512 in conformance with NIST FIPS PUB 180-2, in order to calculate a hash value.
- Certificate Calculation and verification.
- RSA based key decipherment.

All cryptographic functionalities are provided by the platform (see [ST-PL].

SF.MANAGEMENT

This SF manages the access to objects (files, directories, data and secrets) stored in the ID.me file system. It also controls write access of initialization, pre-personalization and personalization data. This SF ensures secure management of secrets such as cryptographic keys. It also covers access to keys as well as secure key deletion. This SF controls all the operations relative to the RAD/VAD management, including the Cardholder (signatory) authentication:

- RAD creation: the RAD is stored and is associated to a maximum successful presentation number (usage counter) and to a maximum error number.
- VAD verification: the RAD can be accessed only if its format and integrity are correct and if the usage counter has not reached 0. If the RAD is blocked, then it cannot be used anymore.
- RAD ratification counter: The number of authentication attempts is limited by a counter associated to the RAD. The counter is decremented each time the VAD verification fails. The RAD cannot be used any longer if the counter reaches zero.
- RAD usage counter: the usage counter is decremented each time the RAD is verified successfully. When this counter reaches 0, the RAD cannot be verified anymore.
- RAD modification: the RAD can be changed by the cardholder (loading a new value). The RAD is managed and stored by the application. The operations on RAD and VAD are performed thanks to services offered by the platform.

This SF manages the security environment of the application and:

- Maintains the roles (e.g. Signatory, Administrator).
- Controls if the authentication required for a specific operation has been performed with success.
- Manages restriction to security function access and to security attribute modification.
- Ensures that only secure values are accepted for security attributes. This security functionality restricts the ability to perform the function Signature creation SFP to Signatory. This security functionality ensures that only Administrator is authorized to
  - Modify Initialization SFP and Signature creation SFP attributes.
  - Specify alternative default values.

This SF provides the electronic signature application with access control and ensures that the following operations are executed by authorized roles:

- Export of SVD to CGA.
- Generation of SCD/SVD pair by the Signatory.
- Creation of RAD by the Administrator.
- Signing of DTBS/R by S.Signatory.

This SF manages Session key generation: Session keys are protected in integrity and confidentiality during generation. This SF enforces secure storage of the session keys during generation.

This SF manages Secret destruction: This SF calls the security function of the JC Platform to erase keys.

This SF manages Secret loading: Loading of a secret is always done by an authorized user through a secure command. This command is accepted only after authentication of the authorized user.

This SF manages Secret transfer: This SF manages the secure transfer of every secret to the crypto processor when used for cryptographic operation.

Access control is enforced by the APDU methods as specified in the interface defined in the functional specification.

SF.TRUSTED_CHANNEL

This SF realizes a secure communication channel to verify authenticity and integrity as well as securing confidentiality of user data between the TOE and other devices connected.

The ID.me Package performs the following secure messaging tasks with external applications (SCA, HID or CGA) for protection of the communication data as the DTBS, authentication data as the VAD or for ensuring the integrity of the SVD:

- PACE or mutual authentication or EAC2 authentication used to establish session keys for secure messaging.
- Encryption and decryption of the transmitted message.
- MAC generation and verification for secure messaging.
- ECDH key agreement.
- Secure hash computation.
- Random number generation.

This SF manages four modes of secure channel during the personalization phase:

- No secure messaging
- Integrity mode
- Confidentiality mode
- Integrity and confidentiality mode

SF.APP_INTEGRITY

This security functionality monitors the integrity of sensitive user data and the integrity of the DTBS/R. The integrity of persistently stored data such as SCD, RAD and SVD is monitored using the platform features (see [ST-PL])). In case of integrity error this TSF will:

- Prohibit the use of the altered data, and
- Inform the S.Signatory about integrity error. This TSF also monitors the integrity of the access conditions of created data objects and also ensures that no residual information is available after a RAD update or clearance.

SF.RATIF

A counter is associated to a secret key, to a password and to the VAD, which is used to count the number of unsuccessful authentication attempts. The counter is reinitialised when the authentication is successful. If the counter reaches its maximum value, then the related secret is suspended or blocked and cannot be used anymore.

10.2 SFRs and TSS - Rationale

All SSCD parts

Protection of the TSF (FPT)

FPT_EMS.1 is met by SF.APP_INTEGRITY and SF.MANAGEMENT which ensure secure execution of cryptographic operations on keys.

FPT_FLS.1 is met by JC Platform and the IC that ensure that failures in the TSF are detected and that the proper actions (reset, card termination) are taken in order to preserve a secure sate of the TOE. It is also met by SF.APP_INTEGRITY that monitors the integrity of sensitive user data and the integrity of the DTBS/R.

FPT_PHP.1 is met by SF.APP_INTEGRITY, the JC Platform and the IC that ensure that physical tampering of the TOE is detected and that the proper actions (reset, card termination) are taken, so that is can be determined if a physical tampering has occurred.

FPT_PHP.3 is met by the JC Platform and the IC that ensures that physical tampering of the TOE is detected and that the proper actions (reset, card termination) in order to protect the TOE.It is also met by SF.APP_INTEGRITY that monitors the integrity of sensitive data.

FPT_TST.1 is met by JC Platform and the IC that performs a set of self-tests at start-up, thus checking the correct operation of the TSF, and that verifies the integrity of the stored executable code before or during its execution and by SF.APP_INTEGRITY that provides means to verify the integrity of the data stored on the TOE.

Security management (FMT)

FMT_SMR.1 is met by SF.AUTHENTICATION that provides user authentication as administrator or as signatory and by SF.MANAGEMENT that grants to the administrator and to the signatory specific access rights, thus defining roles for the TOE.

FMT_SMF.1 requires that the TSF shall be capable of performing the following management functions: (1) Creation and modification of the reference authentication data (RAD), (2) Enabling the signature-creation function, (3) Modification of the security attribute SCD/SVD management, SCD operational, (4) Change the default value of the security attribute SCD Identifier, (5) none. This is realized by SF.MANAGEMENT.

FMT_MOF.1 is met by SF.MANAGEMENT and SF.AUTHENTICATION that ensures that only authenticated signatory can perform DTBS signature.

FMT_MSA.1/Admin is met by SF.AUTHENTICATION and SF.MANAGEMENT that manage the access right policy of the TOE.

FMT_MSA.1/Signatory is met by SF.AUTHENTICATION and SF.MANAGEMENT that manage the access right policy of the TOE.

FMT_MSA.2 is met by SF.AUTHENTICATION and SF.MANAGEMENT that manage the access right policy of the TOE and in particular manages the security attributes.

FMT_MSA.3 is met by SF.AUTHENTICATION and SF.MANAGEMENT that manage the access right policy of the TOE and in particular manage the security attributes, their initialisation and their access rights.

FMT_MSA.4 requires that the TSF shall use the following rules to set the value of security attributes: (1) if S.Admin successfully generates an SCD/SVD pair without S.Sigy being authenticated the security attribute 'SCD operational of the SCD' shall be set to 'no' as a single operation; (2) if S.Sigy successfully generates an SCD/SVD pair the security attribute 'SCD operational of the SCD' shall be set to 'yes' as a single operation. This is realized by SF.MANAGEMENT and SF.AUTHENTICATION.

FMT_MTD.1/Admin

- is met by SF.MANAGEMENT that manages the authentication function and ensure that only authenticated administrator can create the RAD.
- is met by SF.AUTHENTICATION that provides the authentication protocol.

FMT_MTD.1/Signatory

- is met by SF.MANAGEMENT that manages the authentication function and ensure that only authenticated signatory can modify the RAD.
- is met by SF.AUTHENTICATION that provides the authentication protocol.

Identification and authentication (FIA)

FIA_UID.1

- is met by SF.AUTHENTICATION and SF.MANAGEMENT that provide user identification and user authentication prior to enabling access to autorized functions.

FIA_AFL.1

- This SFR is met by SF.AUTHENTICATION and SF.MANAGEMENT.
- This SFR is also met by SF.RATIF that ensures that the RAD is blocked after a defined number of failed successive signatory authentication attempts.

FIA_UAU.1

- is met by SF.AUTHENTICATION and SF.MANAGEMENT that provide user identification and user authentication prior to enabling access to autorized functions.
- is met by SF.TRUSTED_CHANNEL that provides a trusted secure messaging with CGA and SCA.

User data protection (FDP)

FDP_SDI.2/DTBS is met by SF.APP_INTEGRITY, that ensures the integrity of data stored in the TOE, by the JC Platform and the IC that ensure that the proper reaction is taken (reset or card termination) if an integrity error is detected, so that the user knows an error had occurred and that no altered data can be used.

FDP_SDI.2/Persistent is met by SF.APP_INTEGRITY, that ensures the integrity of data stored in the TOE, by the JC Platform and the IC that ensure that the proper reaction is taken (reset or card termination) if an integrity error is detected, so that the user knows an error had occurred and that no altered data can be used.

FDP_RIP.1 is met by SF.MANAGEMENT that ensures erasure of data in FLASH and in RAM (e.g. after the signature creation process), and in particular of SCD, VAD and RAD.

FDP_ACC.1/Signature_Creation is met by SF.MANAGEMENT, SF.AUTHENTICATION that ensure that all the access conditions are met before a dedicated operation can be performed, and in particular that only a user authenticated as signatory can perform signature of DTBS loading from an authorized SCA with a RSA key pair whose consistency has been verified, and by SF.MANAGEMENT, which verify that each received command security status is consistent with the security status of the TOE.

FDP_ACF.1/Signature_Creation is met by SF.MANAGEMENT, SF.AUTHENTICATION that ensure that all the access conditions are met before a dedicated operation can be performed, and in particular that only a user authenticated as signatory can perform signature of DTBS loading from an authorized SCA with a RSA key pair whose consistency has been verified, and by SF.MANAGEMENT, which verify that each received command security status is consistent with the security status of the TOE.

Cryptographic support (FCS)

FCS_COP.1

- is met by SF.APP_CRYPTO that provides RSA key pair consistency check.
- is met by SF.APP_CRYPTO that provides electronic signature generation compliant with RSA PKCS#1 v2.1.
- is met by SF.APP_CRYPTO that provides TDES in CBC mode or AES in CBC mode for encryption and decryption.
- is met by SF.APP_CRYPTO that provides ISO/IEC 9797-1 algorithm 3 padding 2 (3DES) or CMAC (AES) for integrity.
- is met by SF.AUTHENTICATION that provides Symmetric and Asymmetric Mutual Authentications.
- is met by SF.TRUSTED_CHANNEL that provides secure messaging with CGA and SCA.

FCS_CKM.4 is met by SF.MANAGEMENT, as SF.MANAGEMENT manages the secure destruction of secret, and in particular of the SCD.

SSCD parts 2, 4 and 5 only

Cryptographic support (FCS)

FCS_CKM.1

- is met by SF.APP_CRYPTO that ensures that the TOE generates SCD/SVD cryptographic key pairs.
- is also met by SF.APP_CRYPTO, which provides RSA calculation.
- is also met by SF.MANAGEMENT, which ensures the protection of the keys during generation.

User data protection (FDP)

FDP_ACC.1/SVD_Transfer is met by SF.MANAGEMENT, SF.AUTHENTICATION that ensure that only an authorized user can perform a dedicated operation, and in particular that only users authenticated as administrator or signatory can perform SVD export, and by SF.MANAGEMENT, which verify that each received command security status is consistent with the security status of the TOE.

FDP_ACF.1/SVD_Transfer is met by SF.MANAGEMENT, SF.AUTHENTICATION that ensure that only an authorized user can perform a dedicated operation, and in particular that only users authenticated as administrator or signatory can perform SVD export, and by SF.MANAGEMENT, which verify that each received command security status is consistent with the security status of the TOE.

FDP_ACC.1/SCD/SVD_Generation is met by SF.MANAGEMENT, SF.AUTHENTICATION that ensure that only an authorized user under specific conditions can perform a dedicated operation, and in particular that only users authenticated as administrator or signatory can perform SCD/SVD generation, and by SF.MANAGEMENT, which verify that each received command security status is consistent with the security status of the TOE.

FDP_ACF.1/SCD/SVD_Generation is met by SF.MANAGEMENT, SF.AUTHENTICATION that ensure that only an authorized user under specific conditions can perform a dedicated operation, and in particular that only users authenticated as administrator or signatory can perform SCD/SVD generation, and by SF.MANAGEMENT, which verify that each received command security status is consistent with the security status of the TOE.

SSCD parts 3 and 6 only

Trusted path/channels (FTP)

FTP_ITC.1/SCD is met by SF.AUTHENTICATION and SF.MANAGEMENT that enforce the access right policy for SCD Import and by SF.TRUSTED_CHANNEL, SF.APP_CRYPTO that provide cryptographic means to set up a trusted channel between the TOE and a CSP to protect the exchanged data (SCD) from modification and disclosure.

User data protection (FDP)

FDP_UCT.1/SCD is met by SF.AUTHENTICATION and SF.MANAGEMENT that ensure that all the conditions are met before allowing a SCD import and by SF.TRUSTED_CHANNEL, SF.APP_CRYPTO that provide cryptographic means to protect the SCD from disclosure during its import.

FDP_ITC.1/SCD is met by SF.AUTHENTICATION and SF.MANAGEMENT that ensure that all the required conditions are met before allowing a SCD import operation.

FDP_ACC.1/SCD_Import is met by SF.MANAGEMENT, SF.AUTHENTICATION that ensure that only an authorized user can perform a dedicated operation, and in particular that only users authenticated as administrator or signatory can perform SCD import, and by SF.MANAGEMENT, which verify that each received command security status is consistent with the security status of the TOE.

FDP_ACF.1/SCD_Import is met by SF.MANAGEMENT, SF.AUTHENTICATION that ensure that only an authorized user can perform a dedicated operation, and in particular that only users authenticated as administrator or signatory can perform SCD import, and by SF.MANAGEMENT, which verify that each received command security status is consistent with the security status of the TOE.

SSCD part 4 only

Trusted path/channels (FTP)

FTP_ITC.1/SVD is met by SF.AUTHENTICATION and SF.MANAGEMENT that enforce the access right policy for SVD Transfer and by SF.TRUSTED_CHANNEL, SF.APP_CRYPTO that provide cryptographic means to set up a trusted channel between the TOE and a CGA to protect the exchanged data (SVD) from modification and disclosure.

User data protection (FDP)

FDP_DAU.2/SVD is met by SF.AUTHENTICATION and SF.TRUSTED_CHANNEL to ensure that exported SVD to the CGA is authenticated and unmodified.

Identification and authentication (FIA)

FIA_API.1

- The TOE supports RSA calculations in order to generate signatures (SF.APP_CRYPTO).
- The TOE supports the establishment of a trusted channel/path based on 3DES or AES mutual authentication with negotiation of symmetric cryptographic keys used for the protection of the communication data with respect to confidentiality and integrity (SF.TRUSTED_CHANNEL, SF.APP_CRYPTO).

SSCD parts 5 and 6 only

User data protection (FDP)

FDP_UIT.1/DTBS requires that integrity of the DTBS/R to be signed is to be verified, as well as the DTBS/R is not altered by the TOE. This is provided by the trusted channel integrity verification mechanisms (SF.TRUSTED_CHANNEL, SF.APP_CRYPTO).

Trusted path/channels (FTP)

FTP_ITC.1/VAD is met by SF.AUTHENTICATION, SF.MANAGEMENT that enforce the access right policy for VAD transfer and by SF.TRUSTED_CHANNEL, SF.APP_CRYPTO that provide cryptographic means to set up a trusted channel between the TOE and a HID to protect the exchanged data (VAD) from modification and disclosure.

FTP_ITC.1/DTBS is met by SF.AUTHENTICATION and SF.MANAGEMENT that enforce the access right policy for DTBS Import and by SF.TRUSTED_CHANNEL, SF.APP_CRYPTO that provide cryptographic means to set up a trusted channel between the TOE and a SCA to protect the exchanged data (DTBS) from modification and disclosure.

Additional SFRs related to EAC2

FCS_RND.1

- is met by SF.APP_CRYPTO and SF.AUTHENTICATION.

FCS_CKM.1/DH_PACE

- is met by SF.APP_CRYPTO that ensures that the TOE generates cryptographic key pairs for PACE.
- is also met by SF.APP_CRYPTO, which provides DH calculation.
- is also met by SF.MANAGEMENT, which ensures the protection of the keys during generation.

FCS_COP.1/SHA

- is met by SF.APP_CRYPTO that provides Data Hashing.

FCS_COP.1/SIG_VER

- is met by SF.APP_CRYPTO that provides signtaure verification.

FCS_COP.1/PACE_ENC

- is met by SF.AUTHENTICATION that provides PACE authentication, and
- is met by SF.APP_CRYPTO that provides TDES in CBC mode or AES in CBC mode for encryption and decryption.
- is met by SF.TRUSTED_CHANNEL that provides secure messaging with CGA and SCA.

FCS_COP.1/PACE_MAC

- is met by SF.AUTHENTICATION that provides PACE authentication, and
- is met by SF.APP_CRYPTO that provides TDES in CBC mode or AES in CBC mode for MAC calculation.
- is met by SF.TRUSTED_CHANNEL that provides secure messaging with CGA and SCA.

FIA_UAU.1/PACE

- is met by SF.AUTHENTICATION and SF.MANAGEMENT that provide user identification and user authentication prior to enabling access to authorized functions.
- is met by SF.TRUSTED_CHANNEL that provides a trusted secure messaging with CGA and SCA.

FIA_UAU.5/PACE

- is met by SF.AUTHENTICATION and SF.MANAGEMENT that provide user identification and user authentication prior to enabling access to authorized functions.
- is met by SF.TRUSTED_CHANNEL that provides a trusted secure messaging with CGA and SCA.

FIA_AFL.1/Suspend_PIN

- This SFR is met by SF.AUTHENTICATION and SF.MANAGEMENT.
- This SFR is also met by SF.RATIF that ensures that the PIN or PUK is suspended after a defined number of failed successive signatory PACE authentication attempts.

FIA_AFL.1/Block_PIN

- This SFR is met by SF.AUTHENTICATION and SF.MANAGEMENT.
- This SFR is also met by SF.RATIF that ensures that the PIN or PUK is blocked after a defined number of failed successive signatory PACE authentication attempts.

FIA_AFL.1/PACE

- This SFR is met by SF.AUTHENTICATION and SF.MANAGEMENT.
- This SFR is also met by SF.RATIF that ensures that the PIN, PUK, MRZ or CAN is suspended until the next successful authentication attempt by an configurable amount of time after a defined number of failed signatory PACE authentication attempts.

FIA_UAU.1/EAC2_Terminal

- is met by SF.AUTHENTICATION and SF.MANAGEMENT that provide user identification and user authentication prior to enabling access to authorized functions.
- is met by SF.TRUSTED_CHANNEL that provides a trusted secure messaging with CGA and SCA.

FIA_API.1/CA

- The TOE supports the establishment of a trusted channel/path based on 3DES or AES mutual authentication with negotiation of cryptographic keys used for the protection of the communication data with respect to confidentiality and integrity (SF.TRUSTED_CHANNEL, SF.APP_CRYPTO).

FIA_UAU.6/CA

- is met by SF.AUTHENTICATION and SF.MANAGEMENT that provide user identification and user authentication prior to enabling access to authorized functions.
- is met by SF.TRUSTED_CHANNEL that provides a trusted secure messaging with CGA and SCA.

FIA_UID.1/PACE

- is met by SF.AUTHENTICATION and SF.MANAGEMENT that provide user identification and user authentication prior to enabling access to authorized functions.

FIA_UID.1/EAC2_Terminal

- is met by SF.AUTHENTICATION and SF.MANAGEMENT that provide user identification and user authentication prior to enabling access to authorized functions.

FIA_UAU.4/PACE

- is met by SF.AUTHENTICATION and SF.MANAGEMENT that provide user identification and user authentication prior to enabling access to authorized functions.
- is met by SF.TRUSTED_CHANNEL that provides a trusted secure messaging with CGA and SCA.

FIA_UAU.6/PACE

- is met by SF.AUTHENTICATION and SF.MANAGEMENT that provide user identification and user authentication prior to enabling access to authorized functions.
- is met by SF.TRUSTED_CHANNEL that provides a trusted secure messaging with CGA and SCA.

FDP_ACF.1/TRM

- is met by SF.MANAGEMENT, SF.AUTHENTICATION that ensure that only an authorized user under specific conditions can perform a dedicated operation, and in particular that only users authenticated as authenticated terminal, and by SF.MANAGEMENT, which verify that each received command security status is consistent with the security status of the TOE.

FDP_ACC.1/TRM

- is met by SF.MANAGEMENT, SF.AUTHENTICATION that ensure that only an authorized user under specific conditions can perform a dedicated operation, and in particular that only users authenticated as authenticated terminal, and by SF.MANAGEMENT, which verify that each received command security status is consistent with the security status of the TOE.

FDP_UCT.1/TRM

- is met by SF.AUTHENTICATION and SF.MANAGEMENT that ensure that all the conditions are met before allowing user data transmision and by SF.TRUSTED_CHANNEL, SF.APP_CRYPTO that provide cryptographic means to protect user data from disclosure during its import.

FDP_UIT.1/TRM requires that integrity of user data to be authenticated. This is provided by the trusted channel integrity verification mechanisms (SF.TRUSTED_CHANNEL, SF.APP_CRYPTO).

FTP_ITC.1/PACE

- is met is met by SF.AUTHENTICATION and SF.MANAGEMENT that enforce the access right policy for data exchange between the TOE and a PACE terminal and by SF.TRUSTED_CHANNEL, SF.APP_CRYPTO that provide cryptographic means to set up a trusted channel between the TOE and a PACE terminal to protect the exchanged data from modification and disclosure.

FMT_SMR.1/PACE

- is met by SF.AUTHENTICATION that provides user authentication for PACE and by SF.MANAGEMENT that grants to the users specific access rights, thus defining roles for the TOE.

FMT_MTD.1/CVCA_INI

- is met by SF.MANAGEMENT that manages the authentication function and ensures that only authenticated personalization agent can write initial CVCA (public key, meta-data of the certificate, current date).
- is met by SF.AUTHENTICATION that provides the authentication protocol.

FMT_MTD.1/CVCA_UPD

- is met by SF.MANAGEMENT that manages the authentication function and ensures that only authenticated Country Verifying Certification Authority can update CVCA (public key, meta-data of the certificate).
- is met by SF.AUTHENTICATION that provides the authentication protocol.

FMT_MTD.1/DATE

- is met by SF.MANAGEMENT that manages the authentication function and ensures that only authenticated users (Country Verifying Certification Authority, Document Verifier or EAC2 terminal) can modify the current date of CVCA.
- is met by SF.AUTHENTICATION that provides the authentication protocol.

FMT_MTD.1/PA

- is met by SF.MANAGEMENT that manages the authentication function and ensures that only authenticated personalization agent can write SOC and SOD selected in Access Control SFP.
- is met by SF.AUTHENTICATION that provides the authentication protocol.

FMT_MTD.1/SK_PICC

- is met by SF.MANAGEMENT that manages the authentication function and ensures that only authenticated personalization agent can load SKPICC selected in Access Control SFP.
- is met by SF.AUTHENTICATION that provides the authentication protocol.

FMT_MTD.1/KEY_READ

- is met by SF.MANAGEMENT that manages the authentication function and ensures that none can read PACE passwords and SKPICC.
- is met by SF.AUTHENTICATION that provides the authentication protocol.

FMT_MTD.1/Initialize_PIN

- is met by SF.MANAGEMENT that manages the authentication function and ensures that only authenticated authenticated personalization agent can write PIN, PUK, MRZ and CAN, selected in Access Control SFP.
- is met by SF.AUTHENTICATION that provides the authentication protocol.

FMT_MTD.1/Resume_PIN

- is met by SF.MANAGEMENT that manages the authentication function and ensures that only authenticated electronic document holder can resume suspended PIN selected in Access Control SFP.
- is met by SF.AUTHENTICATION that provides the authentication protocol.

FMT_MTD.1/Change_PIN

- is met by SF.MANAGEMENT that manages the authentication function and ensures that only authenticated users (electronic document holder or an authorized terminal) can change blocked PIN selected in Access Control SFP.
- is met by SF.AUTHENTICATION that provides the authentication protocol.

FMT_MTD.1/Unblock_PIN

- is met by SF.MANAGEMENT that manages the authentication function and ensures that only authenticated users (electronic document holder or an authorized terminal) can unblock blocked PIN selected in Access Control SFP.
- is met by SF.AUTHENTICATION that provides the authentication protocol.

FMT_MTD.3

- is met by SF.MANAGEMENT that manages the authentication function and ensures that only secure values are accepted for TSF data of the Terminal Authentication protocol 2 and the Access Control SFP.

FMT_MTD.1/INI_ENA

- is met by SF.MANAGEMENT that manages the authentication function and ensures that only authenticated Manufacturer can write Initialisation Data and Pre-personalisation Data.
- is met by SF.AUTHENTICATION that provides the authentication protocol.

FMT_MTD.1/INI_DIS

- is met by SF.MANAGEMENT that manages the authentication function and ensures that only authenticated Personalisation Agent can read out Initialisation Data and Pre-personalisation Data.
- is met by SF.AUTHENTICATION that provides the authentication protocol.

FTP_ITC.1/CA2

- is met is met by SF.AUTHENTICATION and SF.MANAGEMENT that enforce the access right policy for data exchange between the TOE and an EAC2 terminal and by SF.TRUSTED_CHANNEL, SF.APP_CRYPTO that provide cryptographic means to set up a trusted channel between the TOE and an EAC2 terminal to protect the exchanged data from modification and disclosure.

FMT_LIM.1

- is met by SF.MANAGEMENT and SF.AUTHENTICATION.

FMT_LIM.2

- is met by SF.MANAGEMENT and SF.AUTHENTICATION.