SafeSign Identity Client Standard Version 4.0

Release Document for macOS

Table of Contents

Table of Figures

Warning Notice

All information herein is either public information or is the property of and owned solely by A.E.T. Europe B.V. who shall have and keep the sole right to file patent applications or any other kind of intellectual property protection in connection with such information.

This information is subject to change as A.E.T. Europe B.V. reserves the right, without notice, to make changes to its products, as progress in engineering or manufacturing methods or circumstances warrant.

Installation and use of A.E.T. Europe B.V. products are subject to your acceptance of the terms and conditions set out in the license Agreement that accompanies each product. Nothing herein shall be construed as implying or granting to you any rights, by license, grant or otherwise, under any intellectual and/ or industrial property rights of or concerning any of A.E.T. Europe B.V. information.

Cryptographic products are subject to export and import restrictions. You are required to obtain the appropriate government licenses prior to shipping this Product.

The information contained in this document is provided “AS IS” without any warranty of any kind. Unless otherwise expressly agreed in writing, A.E.T. Europe B.V. makes no warranty as to the value or accuracy of information contained herein. The document could include technical inaccuracies or typographical errors. Changes are periodically added to the information herein. Furthermore, A.E.T. Europe B.V. reserves the right to make any change or improvement in the specifications data, information, and the like described herein, at any time.

A.E.T. EUROPE B.V. HEREBY DISCLAIMS ALL WARRANTIES AND CONDITIONS WITH REGARD TO THE INFORMATION CONTAINED HEREIN, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NON-INFRINGEMENT. IN NO EVENT SHALL A.E.T. EUROPE B.V. BE LIABLE, WHETHER IN CONTRACT, TORT OR OTHERWISE, FOR ANY INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER INCLUDING BUT NOT LIMITED TO DAMAGES RESULTING FROM LOSS OF USE, DATA, PROFITS, REVENUES, OR CUSTOMERS, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF INFORMATION CONTAINED IN THIS DOCUMENT.

Credit Information:

“This product includes cryptographic software written by Eric A. Young (eay@cryptsoft.com). “

“This product includes software written by Tim J. Hudson (tjh@cryptsoft.com). “

Document Information

Document ID: SafeSign IC Standard Version 4.0 Release Document for macOS

Project Information: SafeSign IC Release Documentation

Document revision history:

Version	Date	Author	Changes
1.0	31 March 2023	Drs. C.M. van Houten	First version for SafeSign IC Standard version 4.0 for macOS: release 4.0.0.0-AET.000

Document approval:

Version	Date	Name	Function
1.0	31 March 2023	Dr. A.J.P. Jeckmans	Chief Technology Officer

WE RESERVE THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE

About the Product

This competent all-rounder in terms of strong authentication, integration and compatibility gives you complete freedom and flexibility. Once rolled out, SafeSign Identity Client (IC) serves as the perfect guard for IT security and enables unlimited possibilities for securing your IT infrastructure.

SafeSign IC offers the most comprehensive support available on the market for (card) operating systems, smart cards, USB tokens, languages and functions. This means you have sustainable and permanent freedom of choice when it comes to manufacturer independence.

SafeSign IC enforces two- or multi factor authentication/logon to the network, client PC or application, requiring the end user to have both the USB token or smart card (something you have) and a Personal Identity Number (something you know). USB tokens and smart cards are physically and logically tamper-resistant, ensuring that the end user’s digital credentials can not be copied, modified or shared. Authentication based on smart cards or USB tokens provides the highest degree of security.

SafeSign IC is available for both fixed and mobile devices like desktops, servers, laptops, tablets and smart phones. SafeSign IC is also found in Thin Clients, printers or any other devices requiring authentication.

1 About this Document

The aim of this document is to document the status of the release of SafeSign Identity Client Standard version 4.0 for macOS (henceforth referred to as “SafeSign IC Standard version 4.0 for macOS”).

This document is part of the release documentation of SafeSign IC and is intended to be a reference to both end users and administrators.

2 Release Information

2.1 Deliverables

SafeSign IC Standard version 4.0 for macOS is provided as an Application Bundle distributed in a .dmg file.

All you need to do is drag and drop the tokenadmin Application Bundle to the Applications folder. This will install not only the Token Administration Utility, but will also make the PKCS #11 Library and Smart Card Extension available.

2.2 Date of Release

The date of the release is 31 March 2023.

2.3 Release Details

SafeSign IC Standard version 4.0 for macOS reflects the SafeSign IC product version numbering scheme, i.e. version number, build number and distribution number, which is reflected in the Version Information dialog of the Token Administration Utility.

- Note that the file versions of the components delivered with the release of SafeSign IC Standard version 4.0.0.0 do not necessarily have the name format ‘4.0.0.xxxx’.

Release version: Standard Release 4.0.0.0-AET.000		
Description	File Name	File Version
Smart Card Extension	aetsce.appex	4.5.11.1
Java Card Handling Library	libaetjcss.dylib	3.9.7.1
PKCS #11 Cryptoki Library	libaetpkss.dylib	3.9.17.1
Dialog Library	libaetdlglib.dylib	3.7.19.1
CryptoTokenKit Library	libaetctk.dylib	4.3.11.1
Secure Messaging Library	libaetsm.dylib	3.9.15.1
Kit Library	libaetkit.dylib	4.1.9.1
Token Administration Utility	tokenadmin	3.8.40.1

2.4 Release Documents

SafeSign IC Standard version 4.0 for macOS provides at least the following release documentation:

Document Name	Version
SafeSign Identity Client Standard Version 4.0 Release Document for macOS	1.0

3 Features

The following features are supported by SafeSign IC Standard version 4.0 for macOS:

1. Multiple Token Support
2. Multiple Smart Card Reader Support
3. Multiple Application Support
4. Multiple Language Support
5. Activate QSCD Card Support
6. RSA 4096-bits Keys Support
7. ECC Keys Support

These features are described in the following paragraphs.

3.1 Multiple Token Support

SafeSign IC Standard version 4.0 for macOS supports a large number of smart cards and tokens, as listed in section 7.

3.2 Multiple Smart Card Reader Support

SafeSign IC Standard version 4.0 for macOS supports PCSC 2.0 Class 1 smart card readers.

Note that a correct operation of a smart card reader depends on correctly working reader drivers.

SafeSign IC Standard version 4.0 for macOS has been tested to support a number of smart card readers, as listed in section 8.

3.3 Multiple Application Support

SafeSign IC Standard version 4.0 for macOS supports applications on macOS that work through PKCS #11 or Smart Card Extension.

SafeSign IC Standard version 4.0 for macOS supports a number of applications, that provide the following functionality:

- Web authentication
- Email signing and encryption
- Document signing

SafeSign IC Standard version 4.0 for macOS has been tested to support a number of applications, as listed in section 9.

3.3.1 Crypto Token Kit (CTK)

With the release of OS X 10.10, Apple introduced a new native API to use a smart card and a smart card reader, called the Crypto Token Kit (CTK) Framework. The already existing PC/SC Framework remained available, but became unstable, which manifested itself particularly when removing and/or re-inserting a card or token.

Another new feature was the sandboxing of applications. Applications have to be signed and request certain permissions beforehand (entitlement) in order to be granted access. One such permissions is to access smart cards and tokens through the Crypto Token Kit.

The SafeSign IC Token Administration Utility (based on PKCS #11) is signed and has this entitlement and can thus access the CTK layer.

3.3.1.1 CTK and PKCS #11

If an application (based on PKCS #11) does not have CTK entitlement, the SafeSign PKCS #11 Library that is loaded by that application does not have this entitlement either. Such applications are then not able to (properly) communicate with the token and cannot perform such tasks as accessing a secure web site or digitally signing a document.

For such applications, AET has created a workaround in the form of a registry key that enables these applications (that do not have CTK entitlement) to communicate with tokens through PC/SC, if the communication through CTK fails. This value is called ‘EnableMacOSXPCSCLayerFallback’ and can be found in the file called “registry” in the folder Users/[user name] /Library/Application Support/safesign.

In SafeSign IC Standard version 4.0 for macOS, this value is enabled (on 1) by default. Note that when enabled, performing token operations and removing and /or (re-)inserting the token, may result in unstable behaviour (for which you need to restart the application). When disabled, (by changing its value from 1 to 0) , the token cannot be used in PKCS #11 applications.

- Please be aware that the setting is only a workaround and that AET cannot fix the original problem. If you are using a PKCS #11 application that does not have CTK entitlement, we recommend to contact the vendor or supplier of the application to have their application signed and given the right permissions to use the Crypto Token Kit.

3.3.2 Smart Card Extension

From macOS 10.12 (Sierra) onwards, macOS includes support for Smart Card Driver Extensions, which is defined as follows:

“You can now create NSExtension-based smart card drivers, allowing the contents of certain types of smart cards to be presented as part of the system keychain. This mechanism is intended to replace the deprecated Common Data Security Architecture, although for macOS 10.12, both architectures are supported. The driver extensions are limited to read-only mode, so that it is not possible to alter the contents of a smart card using the standard keychain interface.”

From:
https://developer.apple.com/library/content/releasenotes/MacOSX/WhatsNewInOSX/Articles/OSXv10.html

AET has created such a smart card driver extension, called ‘aetsce.appex’, which is located in the PlugIns folder in the Tokenadmin.app folder (Applications > tokenadmin > Contents > Plugins), after SafeSign IC has been installed.

This smart card extension is (mainly) used for Apple (native) applications, such as Safari and Mail.

Because the extension is read-only (by design), the contents of the smart card are not visible in the KeyChain.app, in accordance with the description above and Apple requirements. The objects are imported in the user’s keychain database.

3.3.2.1 Smart Card Logon

With a smart card driver extension, it should be possible to use the smart card for logon purposes.

- Note that to be able to use the smart card for logon, it needs to contain a certificate suitable for smart card logon (key usage Smart Card Logon).

When a smart card is inserted for which a registered smart card extension is running, macOS will present the "SmartCard Pairing" dialog box. After successfully pairing the smartcard with the current (logged-in) user, you should be able to do smart card logon.

However, smart card logon does work from a locked screen, but it does not work when the user is logged off or the system is restarted. After a log out, you are not able to log in using the PIN because macOS does not change the text "Enter password" to "PIN" on the logon dialog box.

We have seen this issue on all versions of macOS starting from 10.12.6 up to 13.2.

AET has submitted a bug report to Apple and awaits their input and changes done at the OS level by Apple to allow for smart card logon with a SafeSign IC token. Until that time, users may choose to pair their smart card, as described in section 11.2.1, but should be aware that smart card logon will not work.

- There is also an issue that when a smart card or token containing a 1024 bits key is inserted, the Smart Card Pairing dialog does not appear, althoug the card / certificate can be used with the smart card driver extension. For this issue, a bug report has been filed as well.

3.4 Multiple Language Support

SafeSign IC Standard version 4.0 for macOS supports a number of different languages, as listed in section 10.

Although your Mac is (usually) set to display the language of the country in which it was purchased, you can choose a different language to use.

- Note that not all languages may be fully supported by macOS.

You can set language and region options in Language & Region preferences (under Apple menu > System Preferences).

See section 10.

3.5 Activate QSCD Card Support

In accordance with the (European) eIDAS Regulation and related standards for cryptographic modules, the legitimate user / signatory of a Qualified Signature Creation Device (QSCD) is reponsible for activating the card (keys), i.e. to change the state of the card (keys) from non-operational to operational.

The SafeSign IC Token Administration Utility offers users of a QSCD to activate their card. When a QSCD is inserted in the smart card reader, the SafeSign IC middleware will enable the user to activate the card, based on the presence of the Common Criteria (CC) certified SafeSign IC applet and the card specific ATR. If these conditions are met, the Token menu of the SafeSign IC Token Administration Utility will display the option 'Activate Card'.

- Note that the activation process for a particular card may be very specific. It may require the user to:
  - authenticate to the card by entering the PIN (UZI-pas 3, UZI-pas 4 and SafeSign QSCD);
  - change the Transport PIN set for the card (Defensiepas 3);

SafeSign IC Minidriver version 4.0 supports the following QSCD cards:

- Defensiepas 3[1]
- UZI-pas 3[2]
- SafeSign Default / Generic QSCD (JCOP 3)
- UZI-pas 4
- QSCD on JCOP 4

3.6 RSA 4096-bits Keys Support

SafeSign IC Standard version 4.0 includes support for RSA 4096-bits keys.

This functionality requires one of the following:

- A JCOP 4 card with the Common Criteria (CC) certified SafeSign IC applet version 3.0.1.12 or 3.0.1.13 and a smart card reader that supports extended APDU;
- A G+D Sm@rtCafe Expert 7.0 card with SafeSign IC (StdR) applet version 3.1.0.35;
- A G+D Sm@rtcafe Expert 7.0 CUT S USB token with SafeSign IC (StdR) applet version 3.1.0.35.

  - Note that support for RSA 3072-bits keys is also included.

[1] Defensiepas 3 is supported from SafeSign IC Minidriver version 3.5.4.0 onwards.

[2] UZI-pas 3 is supported from SafeSign IC Minidriver version 3.5.6.1 onwards.

3.6.1 Extended APDU

An extended APDU is an APDU (command) with data and/or response of more than 256 bytes, as defined by ISO/IEC 7816-4.

Because sending extended APDUs can cause issues with readers / drivers that do not support it (such as the reader or drivers crashing), a whitelist is added in the registry with the names of the readers tested and are supported, that indicates per reader what the maximum APDU size possible is. When your reader is not in the list, the use of extended APDU is not possible.

- Note that the G+D Sm@rtCafe Expert 7.0 FIPS card does not need a smart card reader with extended APDU support for RSA 3072-bits and 4096-bit keys.

The registry can be found here: */Users/[user name]/Library/Application Support/safesign*

The list can be found in the registry under:
HKEY_LOCAL_MACHINE\SOFTWARE\A.E.T. Europe B.V.\SafeSign\2.0\Readers\

⚠ These readers are verified by AET to work on all Operating Systems supported and must not be modified.

See also section 8.1.

3.7 ECC Keys Support

SafeSign IC Standard version 4.0 includes support for ECC keys.

For this functionality to be available, the following is required:

- A JCOP 4 QSCD card with the Common Criteria (CC) certified SafeSign IC applet version 3.0.1.13.
- A G+D Sm@rtCafe Expert 7.0 FIPS card with SafeSign IC (StdR) applet version 3.1.0.35.
- A G+D Sm@rtcafe Expert 7.0 CUT S USB token with SafeSign IC (StdR) applet version 3.1.0.35.

The following NIST named curves are supported:

- P-256
- P-384
- P-521

The following algoritms are supported for these curves:

- ECDSA
- ECDH

4 New Features and Fixes

SafeSign IC Standard version 4.0 for macOS has a number of new features.

Section 4.1 will describe the new features and functionality.

4.1 New

- Added support for ECC keys.
- Added support for macOS 13 (Ventura).

5 Known Issues

5.1 General

- The version of Firefox tested cannot handle a certificate that does not have a label. As a workaround, you can set a label on the keys and certificate in the Token Administration Utility’s Show Token Objects dialog. Note that the ‘EditLabelAction’ is disabled by default in the registry.
- Encrypting and/or decrypting an e-mail message with an ECDH key / certificate using the SafeSign IC PKCS #11 library installed as a security module in Thunderbird results in an error message (unable to encrypt message). However, this issue was reproduced with an ECC key generated in software as well and other evidence seems to point to this being a limitation within Thunderbird. It is expected that Thunderbird will start working once it has been implemented properly.
- When signing a document with Adobe Reader with an ECC key / certificate (ECDH or ECDSA), there is an error when the issuer type of the certificate is RSA (“The credential selected for signing is invalid”). This issue was reproduced with an ECC key generated in software as well, so this seems to points to an issue within Adobe Reader. Possibly, Adobe Reader determines the signature algorithm type on the signature algorithm used to sign the certificate, requiring the issuer's certificate to be the same type.
- There is an issue with encrypting / decrypting in Apple Mail, when using an ECC certificate. It seems that the key usage extension plays a role in mail encryption in macOS. Apparently, a key / certificate with a key encipherment key usage extension set is needed. This issue was reproduced with an ECC key generated in software as well, so this seems to point to a limitation within Apple Mail. Note that this issue does not exist when using an RSA key for encrypting / decrypting.
- For the pairing dialog to appear, an RSA or ECDSA key / certificate needs to be present on a JCOP 4 QSCD card; on a G+D Sm@rtCafe Expert 7.0 card / token, an RSA key / certificate needs to be present.
- There is an issue with signing a document in LibreOffice when using a JCOP 4 card with RSA 3072-bits / 4096-bits keys. Signing a document fails (it is possible to select the certificate, but the signing does not take place), caused by the fact that LibreOffice does not have CTK entitlement, whereupon it will fall back to PC/SC, making the use of extended APDU not possible.

5.2 SafeSign IC

- When you export a certificate from the token in the Token Administration Utility and then import it again to the same token, SafeSign IC will not recognise that the certificate already exists on the card, resulting in a duplicate certificate (with maybe a different name).
- The PUK is not encrypted / protected by secure messaging during initialization, as by design. When the PUK is changed or used to authenticate, it will be encrypted.
- The Token Administration Utility should not be running in the background when other applications using the smart card or token are open. The Token Administration Utility is a user interface, intended for local smart card operations, such as changing the PIN. If the Token Administration Utility is running in the background and another application (using PKCS #11 or Smart Card Extension) is also running, they might interfere, resulting in for example, the application asking for the PIN multiple times when doing a secure web authentication or the Token Administration Utility to wait before doing a certain card operation (such as Show Token Objects).
- When a smart card or token containing a 1024 bits key is inserted, the Smart Card Pairing dialog does not appear.

6 Supported Operating Systems

As of SafeSign IC Standard version 4.0, SafeSign IC supports macOS 12 and 13 running on both Intel and M1 processors. One installer is available, that will install and work on both macOS 12 and 13 (Intel and M1).

SafeSign IC Standard version 4.0 for macOS has been tested to support the following macOS Operating System(s):

Operating System	SafeSign IC 4.0.0.0
macOS 12.6 (Monterey)	√
macOS 13.2 (Ventura)	√

Note that only support requests for issues reproduced on the supported Operating System(s) will be taken into consideration.

Note that SafeSign IC Standard version 4.0 for macOS is not tested to work on beta versions of the mentioned Operating Systems.

7 Supported Tokens

SafeSign IC Standard version 4.0 for macOS supports a number of smart cards and tokens, as listed below.

These tokens have been tested to work as part of the release testing for SafeSign IC Standard version 4.0 for macOS.

The number of cards supported in SafeSign IC for macOS has been decreased, to support only those cards that are non-proprietary and are compliant with at least Java Card 2.2.2 and higher.

The SafeSign IC PKI applet enables end users to utilise Java Card 2.2.2 and higher compliant cards with the SafeSign Identity Client middleware. A Java card or token must contain an installed SafeSign Identity Client applet before it can be used with SafeSign Identity Client.

> *As the correct functioning of SafeSign Identity Client is depending on a properly produced smart card or USB Token, AET requires that smart cards and / or USB tokens are produced for use with SafeSign Identity Client in accordance with our QA policies (which require i.a. the correct applet to be pre-installed in a secure environment and a custom keyset). This is a condition to be eligible for support by AET in case of problems, in addition to the purchase / existence of a valid SafeSign Identity Client Maintenance and Support Agreement.*

If you have any questions, please contact AET (safesignsupport@aeteurope.com).

Card Type
Defensiepas 2
Defensiepas 3 (QSCD)
G&D Sm@rtCafé Expert 3.2
G&D Sm@rtCafé Expert 4.0
G&D Sm@rtCafé Expert 5.0
G&D Sm@rtCafé Expert 6.0
G&D Sm@rtCafé Expert 7.0
Gemalto IDCore 30
Infineon Oracle JCOS Ed.1
JCOP21 v2.3
NXP J2A080 / J2A081 (JCOP 2.4.1 R3)
NXP J2D081 (JCOP 2.4.2 R2)
NXP J3A080 (JCOP 2.4.1 R3)
NXP JCOP 2.4.2 R3
NXP JCOP 3 SecID P60
NXP JCOP 4 P71

Card Type
Oberthur IDone Cosmo v7.0
RDW ABR kaart
Rijkspas
Rijkspas 2
StarSign Crypto USB Token S
UZI-pas 2
UZI-pas 3 (QSCD)
UZI-pas 4 (QSCD)

8 Supported Smart Card Readers

In principle, SafeSign IC Standard version 4.0 for macOS supports PC/SC v1.0 compliant smart card readers that supply a current of at least 60mA.

We recommend that customers make a careful selection of the smart card reader to use, as there are many smart card readers on the market, with such restrictions as ‘buggy’ PC/SC drivers (especially older smart card reader models), not enough power supply for cryptographic cards (which require a minimum of 60mA) and faulty T=0 or T=1 protocol implementation. These reader problems are beyond the control of smart cards and SafeSign Identity Client.

The following table lists the specific readers that have been tested with SafeSign IC Standard version 4.0 for macOS:

Smart Card Reader Manufacturer and Model	Class
HID® OMNIKEY® 3121 USB Smart Card Reader Revision D/2019	1

Note that smart card readers that have been tested or have been working at a given time with a previous SafeSign IC Standard version for macOS, may not (still) work or be supported in any or all versions of SafeSign IC Standard version 4.0 for macOS.

8.1 Extended APDU

In order to be able to generate RSA 4096-bits (and 3072-bits) keys on a JCOP 4 card, the smart card reader should support extended APDU.

The ISO 7816-4:2013 specification defines an extended APDU as any APDU whose payload data, response data or expected data length exceeds the 256 byte limit.

The following readers have been tested with RSA 4096-bits keys and extended APDU:

- HID OMNIKEY 3121 USB (Part No. R31210320-01, revision B/2016 and revision D/2019)
- Thales IDbridge CT30
- ACS ACR38 (P/N ACR38U-N1)

These card readers have been tested using the OS CCID driver, i.e. the native CCID driver on macOS:

- The version of the CCID driver in macOS 12 (Monterey) is 1.4.34.
- The version of the CCID driver in macOS 13 (Ventura) is 1.5.0.

Depending on the Operating System, the reader name may be different. This explains the different names in the registry.

9 Supported Applications

SafeSign IC Standard version 4.0 for macOS has been tested in accordance with AET's Quality Assurance procedures and the SafeSign IC Standard for macOS test plan. This includes testing of a number of defined and representative applications to verify a correct functioning of the SafeSign IC components and Libraries.

The following applications have been tested with SafeSign IC Standard version 4.0.0.0 for macOS on macOS 13.2:

Application	Version	Functionality
Token Administration Utility	3.8.40.1	PKCS #11 token management functions
Google Chrome	111.0.5563.64	Authentication to a secure web site
Mozilla Firefox	111.0.1	Authentication to a secure web site
Mozilla Thunderbird	102.9.0	Signing and decrypting e-mail messages
Apple Safari	16.3	Authentication to a secure web site
Apple Mail	16.0	Signing and decypting e-mail messages
Adobe Reader DC	2023.001.20093	Digitally signing a document
LibreOffice	7.5.1.2	Digitally signing a document

- Note that PKCS #11 applications need the PKCS #11 Library to be loaded / installed as a security module. The SafeSign IC PKCS #11 Library (called 'libaetpkss.dylib') can be found in: /Applications/tokenadmin.app/Contents/Frameworks/.
- Firefox can no longer be used to do certificate enrollment with key pair generation.

9.1 Token Administration Utility

With the SafeSign IC Token Administration Utility, you can perform (local) smart card related operations, such as changing the PIN for your smart card or token.

9.2 Google Chrome

The Google Chrome browser works with the AET Smart Card Extension. When installed correctly, you can perform secure web authentication with a SafeSign IC token.

9.3 Mozilla Firefox

As of Mozilla FireFox version 90, Firefox will automatically find and offer to use client authentication certificates provided by the operating system (Windows and macOS). See: https://blog.mozilla.org/security/2021/07/28/making-client-certificates-available-by-default-in-firefox-90/.

This means that on macOS, Firefox works with the AET Smart Card Extension and you no longer need to install the SafeSign PKCS #11 Library installed as a security module in Firefox.

9.4 Mozilla Thunderbird

With the SafeSign PKCS #11 Library installed as a security module in Thunderbird, you can send and receive signed and/or encrypted message with a SafeSign IC token.

To verify whether the SafeSign PKCS #11 Library is installed as a security module in Thunderbird, go to Preferences -> Advanced -> Certificates (tab) -> Security Devices (button).

9.5 Apple Safari

The Apple Safari browser works with the AET Smart Card Extension. When installed correctly, you can perform secure web authentication with a SafeSign IC token.

9.6 Apple Mail

The Apple Mail application works with the AET Smart Card Extension. When installed correctly, you can send and receive signed and/or encrypted message with a SafeSign IC token.

9.7 Adobe Reader DC

Adobe Reader DC (now) works with the AET Smart Card Extension. It is no longer required to install the SafeSign PKCS #11 Library as a security module in Adobe.

9.8 LibreOffice

It is possible to digitally sign documents in LibreOffice with a SafeSign IC Token.

See: https://help.libreoffice.org/Common/Applying_Digital_Signatures

With the SafeSign PKCS #11 Library installed as a security module in Firefox or Thunderbird (as described in section 11.3), you can sign documents with a SafeSign IC token.

- Note that you may have to indicate the path to the PKCS #11 Library in Tools > Options > Security: Certificate Path

10 Supported Languages

The following languages are supported in SafeSign IC Standard version 4.0 for macOS:

- Basque (Basque);
- Catalan (Catalan);
- Chinese (Simplified, China);
- Chinese (Traditional, Hong Kong SAR; Traditional, Taiwan);
- Croatian (Croatia);
- Czech (Czechia);
- Dutch (Netherlands);
- English (United States);
- Finnish (Finland);
- French (France);
- German (Germany);
- Hungarian (Hungary);
- Italian (Italy);
- Italian (Switzerland);
- Japanese (Japan);
- Korean (Korea);
- Lithuanian (Lituania);
- Portuguese (Portugal);
- Portuguese (Brazil);
- Russian (Russia);
- Serbian (Cyrillic, Serbia)
- Serbian (Latin, Serbia);
- Spanish (Spain);
- Thai (Thailand);
- Turkish (Turkey);
- Ukrainian (Ukraine).

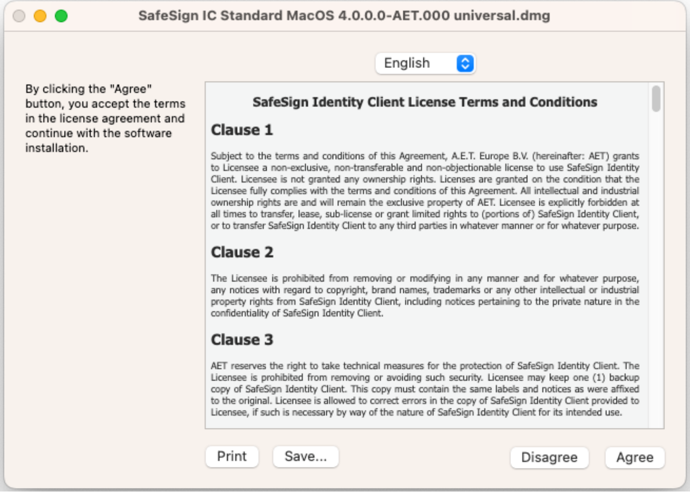
11 SafeSign IC Installation

Note that users need to have sufficient privileges and basic knowledge of macOS to install SafeSign IC Standard version 4.0 for macOS.

- Note that if any previous version of SafeSign IC for macOS is installed, it should be uninstalled. Make sure to restart your computer after uninstallation.

Save the installation file (.dmg) to a location on your MAC computer and open it (to mount it as a volume called “tokenadmin”).

This will open the *SafeSign Identity Client License Terms and Conditions* window:



SafeSign IC Standard MacOS 4.0.0.0-AET.000 universal.dmg

By clicking the "Agree" button, you accept the terms in the license agreement and continue with the software installation.

SafeSign Identity Client License Terms and Conditions

Clause 1

Subject to the terms and conditions of this Agreement, A.E.T. Europe B.V. (hereinafter: AET) grants to Licensee a non-exclusive, non-transferable and non-objectionable license to use SafeSign Identity Client. Licensee is not granted any ownership rights. Licenses are granted on the condition that the Licensee fully complies with the terms and conditions of this Agreement. All intellectual and industrial ownership rights are and will remain the exclusive property of AET. Licensee is explicitly forbidden at all times to transfer, lease, sub-license or grant limited rights to (portions of) SafeSign Identity Client, or to transfer SafeSign Identity Client to any third parties in whatever manner or for whatever purpose.

Clause 2

The Licensee is prohibited from removing or modifying in any manner and for whatever purpose, any notices with regard to copyright, brand names, trademarks or any other intellectual or industrial property rights from SafeSign Identity Client, including notices pertaining to the private nature in the confidentiality of SafeSign Identity Client.

Clause 3

AET reserves the right to take technical measures for the protection of SafeSign Identity Client. The Licensee is prohibited from removing or avoiding such security. Licensee may keep one (1) backup copy of SafeSign Identity Client. This copy must contain the same labels and notices as were affixed to the original. Licensee is allowed to correct errors in the copy of SafeSign Identity Client provided to Licensee, if such is necessary by way of the nature of SafeSign Identity Client for its intended use.

Figure 1: SafeSign Identity Client License Terms and Conditions

- Carefully read the License and click **Agree** to continue with the software installation

Upon clicking **Agree**, the following window will be displayed:

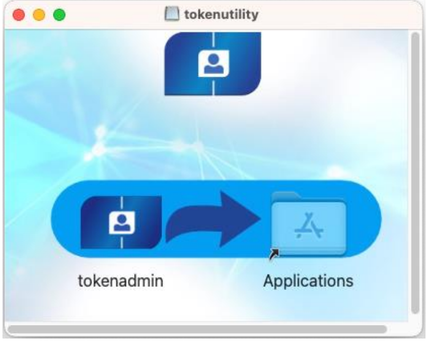


Figure 2: tokenadmin

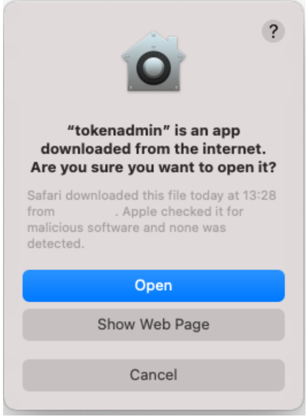
By dragging the tokenadmin Application Bundle to the Applications folder, SafeSign IC will be installed.

- Drag the tokenadmin icon to the Applications icon
- Close the tokenadmin window and eject the “tokenadmin” volume.

11.1 Apple Notarization

Beginning in macOS 10.15, all software built after June 1, 2019, and distributed with Developer ID must be notarized. When software is notarized, Gatekeeper[3] places descriptive information in the initial launch dialog to help the user make an informed choice about whether to launch the app.

The SafeSign IC software has been notarised by Apple and the following message will be displayed in accordance with Apple's policy:



"tokenadmin" is an app downloaded from the internet. Are you sure you want to open it?

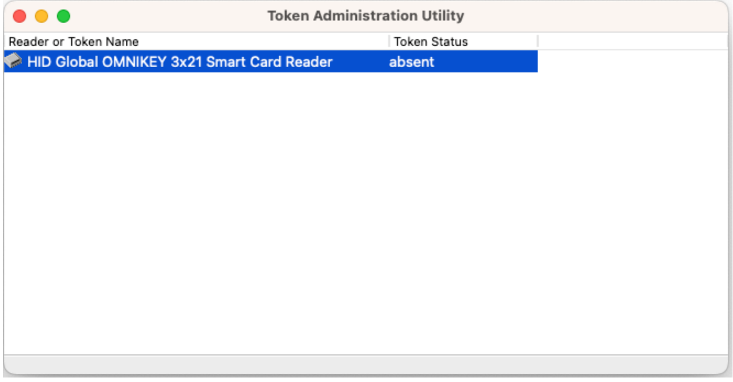
Safari downloaded this file today at 13:28 from . Apple checked it for malicious software and none was detected.

Figure 3: Gatekeeper: Apple checked it for malicious software

Once you have opened the app, this message will no longer appear.

11.2 Register Smart Card Extension

In order to be able to use your token with macOS (native) applications that support Smart Card Extension, you should start the tokenadmin.app (available in the Applications folder) at least once, with a smart card reader attached or a USB token inserted (so that the system is told where to look for the smart card extension):



Reader or Token Name	Token Status
HID Global OMNIKEY 3x21 Smart Card Reader	absent

Figure 4: Token Administration Utility: Reader Name

This will register the AET Smart Card Extension.

- In some cases, this action may not be enough and either a logout or login is necessary (and in some very rare cases, a complete restart of the machine).

[3] Gatekeeper is a security feature of the macOS operating system by Apple. It enforces code signing and verifies downloaded applications before allowing them to run, thereby reducing the likelihood of inadvertently executing malware

After the smart card extension is registered, when inserting a smart card, macOS will try to match the AID of the inserted card with a registered smart card extension. When this is done, the smart card objects will be imported into the user's keychain database. Note that this is read-only, it is not possible to alter the contents of a smart card using the standard keychain interface (application).

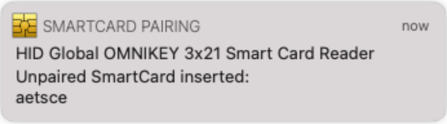
When the Smart Card Extension is registered successfully and the smart cards objects imported in the keychain database, you will be able to use your smart card for such applications as Safari.

11.2.1 Smart Card Pairing

When the initial process described above has taken place, the macOS security layer will show a pairing dialog, intended to enable your smart card for logon. However, there is an issue with smart card logon on macOS, as described in section 3.3.2.1. Once this is fixed, it will be possible to use the smart card for logon.

Though the pairing process can be completed successfully, users are advised not to do so. The description below is for information only.

When you select a smart card, the Smart Card Pairing dialog will appear:



SMARTCARD PAIRING

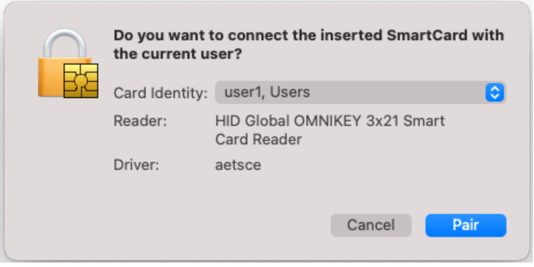
now

HID Global OMNIKEY 3x21 Smart Card Reader
Unpaired SmartCard inserted:
aetsce

Figure 5: SmartCard Pairing: Unpaired smart card inserted

- Close it or click on it to start the pairing process.

If you clicked the dialog to pair your smart card, you can choose to:



Do you want to connect the inserted SmartCard with the current user?

Card Identity: user1, Users

Reader: HID Global OMNIKEY 3x21 Smart Card Reader

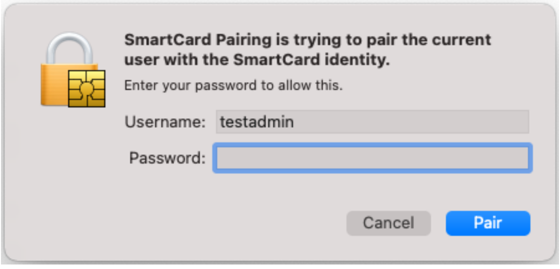
Driver: aetsce

Figure 6: Smart Card Pairing: Pair

- Cancel: the dialog will re-appear each time you insert a card (even the same card)
- Pair: the pairing process will commence
  - Note that if you opt for pairing, you should finish the whole pairing process.

If the user opts for pairing, the following process will take place:

1 Enter the administrator's password to allow pairing:



SmartCard Pairing is trying to pair the current user with the SmartCard identity.

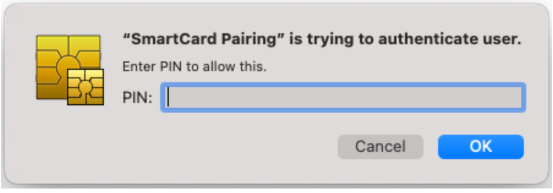
Enter your password to allow this.

Username: testadmin

Password:

Figure 7: SmartCard Pairing is trying to pair the current user with the SmartCard identity

2 Enter the PIN of the smart card:



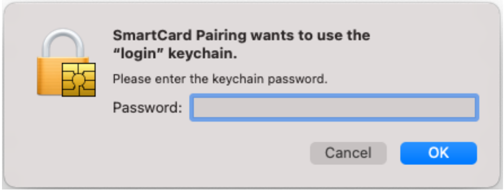
"SmartCard Pairing" is trying to authenticate user.

Enter PIN to allow this.

PIN:

Figure 8: SmartCard Pairing is trying to authenticate user

3 Enter the Login Keychain password:



SmartCard Pairing wants to use the "login" keychain.

Please enter the keychain password.

Password:

Figure 9: SmartCard Pairing wants to use the "login" keychain

11.3 Installation of Security Module

When you have installed SafeSign IC Standard version 4.0 for macOS, you may want to use SafeSign Identity Client with PKCS #11 applications that support the use of tokens. In order to do so, you should install or "load" the SafeSign Identity Client PKCS #11 library as a security module in these applications .

As of Mozilla Firefox version 90, Firefox will automatically find and offer to use client authentication certificates provided by the operating system on macOS, through a library / module called 'OS Client Cert Module'.

This means that Firefox now works with the SafeSign IC Smart Card Extension and that it is no longer necessary to install the SafeSign IC PKCS #11 Library as a security module in Firefox.

- Note that even though the Firefox Installer is still available in the Token Administration Utility's Integration menu, installing the SafeSign IC PKCS #11 Library as a security module in Firefox is not recommended.

For other applications such as Thunderbird, you will need to do so manually, by pointing to the location and name of the SafeSign Identity Client PKCS #11 library, i.e. /Applications/tokenadmin.app/Contents/Frameworks/libaetpkss.dylib.

11.4 Uninstallation

It is possible to uninstall SafeSign IC Standard version 4.0 for macOS from your macOS computer.

Before uninstalling SafeSign IC, you need to take into account the following requirements:

1. Make sure that no smart card or token is inserted;
2. Close the Token Administration Utility / make sure that the Token Administration Utility is not open / running;
3. Restart the computer.

You can then uninstall SafeSign IC Standard version 4.0 for macOS, by dragging the tokenadmin Application Bundle to the Trash can or to right-click the tokenadmin application and select ‘Move to Bin’.

This procedure is required because the Smart Card Extension process may still be running, making it impossible to uninstall SafeSign IC.

- Note that more experienced users may use a Terminal to kill the Smart Card Extension process.