swissbit®

Frequently Asked Questions

iShield Key Series

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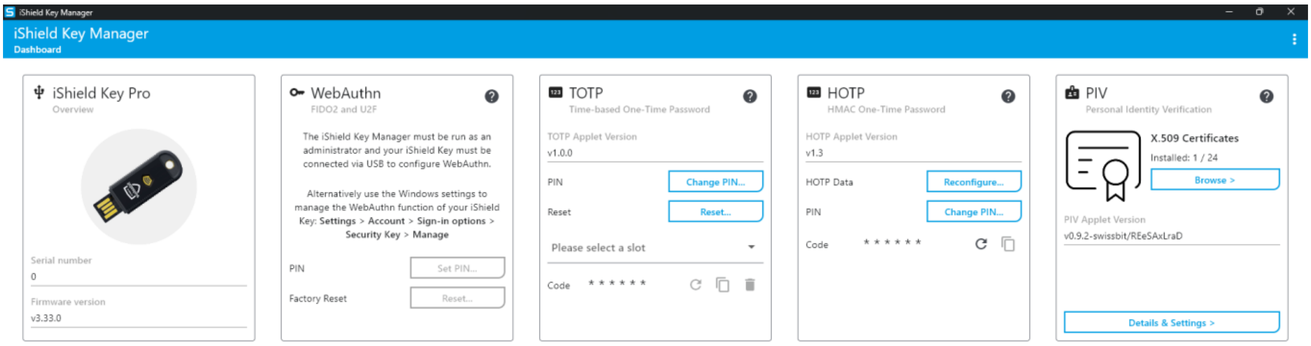
Contents

1 Introduction

An iShield Key is a hardware security device designed for strong two-factor authentication (2FA) or FIDO2 passwordless authentication. It strengthens account security by requiring both something you know (password & PIN) and something you have (the iShield Key).

1.1 How does an iShield Key work?

Once connected to a computer or NFC-enabled mobile device, the iShield Key can be configured using the iShield Key Manager (hereafter referred to as iKM). iShield Keys support multiple authentication protocols (FIDO2, U2F, HOTP, TOTP, Smartcard/PIV).



Serial number
0

Firmware version
v3.33.0

The iShield Key Manager must be run as an administrator and your iShield Key must be connected via USB to configure WebAuthn.

Alternatively use the Windows settings to manage the WebAuthn function of your iShield Key: **Settings** > **Account** > **Sign-in options** > **Security Key** > **Manage**

PIN

Factory Reset

TOTP Applet Version
v1.0.0

PIN

Reset

Please select a slot

Code ******

HOTP Applet Version
v1.3

HOTP Data

PIN

Code ******

Installed: 1 / 24

PIV Applet Version
v0.9.2-swissbit/REeSAxLraD

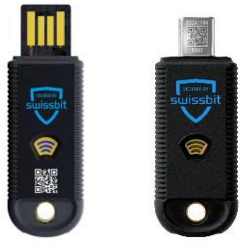
The iShield Key Manager is compatible with Windows, Mac, Linux and Android (TOTP only) devices.

1.2 What types of iShield Key are there?

iShield Key FIDO2:

- USB-A & NFC
- USB-C & NFC

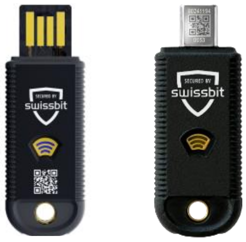
This model has a **BLUE** logo



iShield Key PRO:

- USB-A & NFC
- USB-C & NFC

This model has a **WHITE** logo



2 iShield Key Features by Protocol

The iShield Key FIDO2 is a simple security key that is mainly used to protect online accounts and for passwordless login. It uses the FIDO2 standard for strong two-factor authentication.

The iShield Key Pro, on the other hand, offers extended functions. In addition to FIDO2, it also supports OTP for offline scenarios and PIV for the secure storage of digital certificates. This makes it more flexible to use, especially in corporate environments.

2.1 Summary

Feature	iShield Key FIDO2	iShield Key Pro
FIDO2	✓	✓
HOTP	✗	✓
TOTP	✗	✓
PIV	✗	✓

iShield Key FIDO2: Ideal for private users or home office users who want to secure their online accounts with strong two-factor authentication. For example, for access to social media, email accounts and online banking.

iShield Key Pro: In addition to the compatibility of the FIDO2 key, the Pro key offers support for other applications and services that use HOTP, TOTP and PIV, which facilitates integration into complex IT environments.

3 Hardware Defaults

3.1 How many slots offer applets

FIDO/Passkey: 32 slots

TOTP: 42 slots

PIV: 24 slots

3.2 Specific rules for each applet

3.2.1 HOTP

Standard PIN: 1234

Blocking rule: After 10 incorrect entries, the PIN is irrevocably blocked. After blocking, you can still generate one-time passwords, but you cannot change any secret keys or counters.

Reset: Successful authentication of the PIN resets the counter for failed attempts.

3.2.2 TOTP

PIN protection option: Users can protect TOTP slots with a PIN.

Locking rule: The PIN is irrevocably locked after 10 incorrect entries. A PIN reset is required, which deletes all login information in PIN-protected slots.

Reset: Successful authentication of the PIN resets the counter for failed attempts. A complete factory reset resets the TOTP function to the factory settings and deletes all TOTP data and login information.

3.2.3 PIV

Default PIN: 123456

Standard PUK: 12345678

Management PIN *01:02:03:04:05:06:07:08:01:02:03:04:05:06:07:08:01:02:03:04:05:06:07:08*

Locking rule: The PIN and PUK are locked after a certain number of incorrect entries when the maximum number of attempts (retries) is reached. If both PIN and PUK are locked, you must reset the PIV applet, which deletes all PIV data and restores the factory settings.

PIN and PUK retries: The default number of attempts for PIN and PUK is 5 and 3 respectively, but these values can be adjusted between 1 and 255.

Unlocking: The PUK can be used to unlock the PIN. If both are locked, a complete reset is required.

4 Troubleshooting

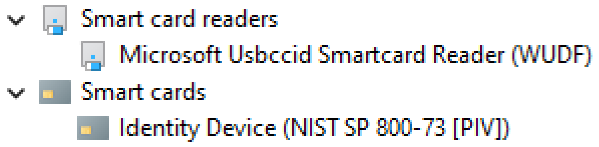
4.1 iShield Key is not detected

- Ensure that they key is inserted correctly (USB-A contacts are facing up).
- Re-insert the key and indicator light will immediately blink red, then green for about 1 second.
- Try it with another device, e.g. smartphone via NFC

4.2 iShield Key is not recognized on Windows

- The FIDO2 interface does not require any third-party software or drivers and should work automatically on the OS and compatible applications and browsers.
- The PIV interface will require 1) a generic Microsoft mini-driver and 2) a USBCCID smartcard reader driver that will both be installed automatically by Windows Update.

The Windows Device Manager will display the following 2 entries:

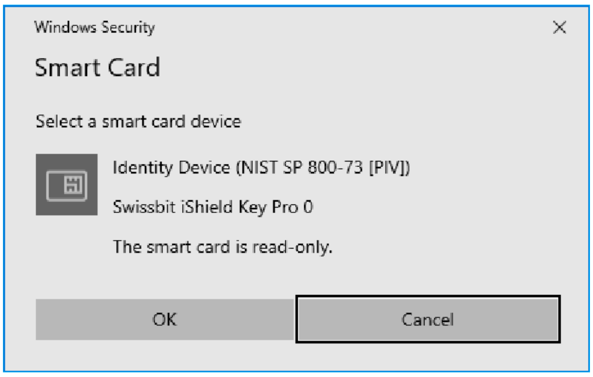


Smart card readers
Microsoft Usbccid Smartcard Reader (WUDF)
Smart cards
Identity Device (NIST SP 800-73 [PIV])

4.3 The smart card is read-only / cannot perform the requested operation

If your iShield Key Pro is displayed to be read-only or to not support the requested operation, the OpenSC minidriver is not properly installed. For provisioning your key you need to use the OpenSC minidriver, see User Manual section 7.2.1.

Verify that you correctly installed a compatible OpenSC version including the OpenSC minidriver.



Windows Security

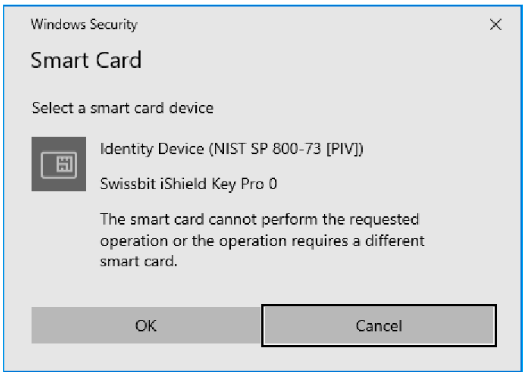
Smart Card

Select a smart card device

Identity Device (NIST SP 800-73 [PIV])

Swissbit iShield Key Pro 0

The smart card is read-only.



Windows Security

Smart Card

Select a smart card device

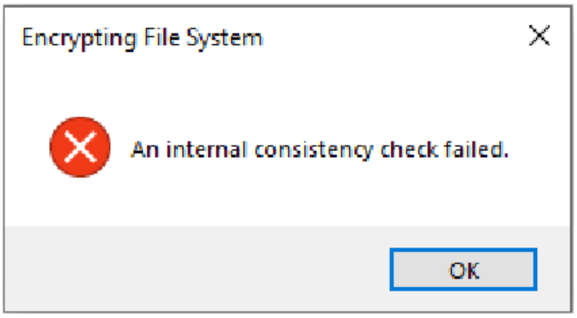
Identity Device (NIST SP 800-73 [PIV])

Swissbit iShield Key Pro 0

The smart card cannot perform the requested operation or the operation requires a different smart card.

4.4 An internal consistency check failed"

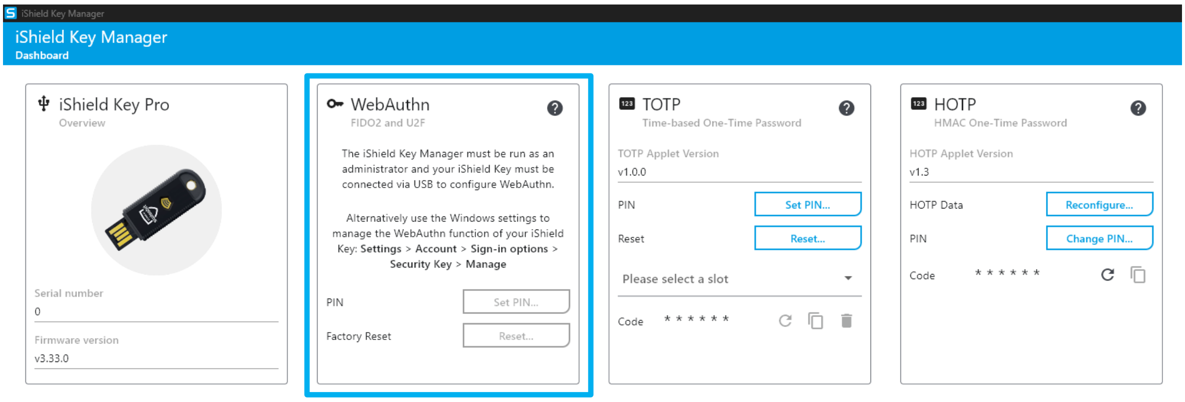
The error "An internal consistency check failed" is commonly caused by misconfiguration of OpenSC. Please make sure to follow all steps in User Manual section 7.4: Verify your OpenSC profiles directory, management key file, environment variables and OpenSC configuration file, in particular the iShield PIV module path and presence of required system runtime libraries.



Encrypting File System

An internal consistency check failed.

4.5 iKM shows WebAuthn (FIDO2 and U2F) grayed out



iShield Key Manager
Dashboard

iShield Key Pro
Overview

Serial number: 0

Firmware version: v3.33.0

WebAuthn
FIDO2 and U2F

The iShield Key Manager must be run as an administrator and your iShield Key must be connected via USB to configure WebAuthn.

Alternatively use the Windows settings to manage the WebAuthn function of your iShield Key: **Settings** > **Account** > **Sign-in options** > **Security Key** > **Manage**

TOTP
Time-based One-Time Password

TOTP Applet Version: v1.0.0

HOTP
HMAC One-Time Password

HOTP Applet Version: v1.3

Please run the iShield Key Manager with Administrator rights. If you do not have local Administrator rights, you must contact your IT Administrator for support.

4.6 What to do if you lose your iShield Key?

- **Deactivate immediately:** Remove the lost iShield Key from authorized devices in online accounts.
- **Register backup:** Use a registered backup iShield Key to restore access.
- **Account recovery:** Follow the service's account recovery procedure if no backup is available (other verification methods may be required).
- **Can someone steal my data?** No, the iShield Key does not give out any data. Without the PIN it is worthless and without the login data, e.g. e-mail address for Amazon account, and the PIN you set yourself.

4.7 The service says that the iShield key code is invalid:

- **Time synchronization:** Some services require an exact time match between the device and the authentication service. Verify the time and time zone configuration on the computer.
- **Slot configuration:** iShield keys have several "slots" that must be selected correctly.

4.8 iShield Key no longer works:

- Check for physical damage (cracks, bent connections).
- Check the configuration of the iShield key slots using iKM
- Reset applets in the iShield Key Manager (ATTENTION all data will be irrevocably deleted)

5 Initial Setup Using iShield Key Manager

5.1 iShield Key Manager Installation

- Download iShield Key Management Kit (Windows)

  https://www.swissbit.com/files/public/ikm/iShield_Key_Management_Kit_Windows.zip
- Download iShield Key Management Kit (Linux x86_64: Ubuntu, Debian)

  https://www.swissbit.com/files/public/ikm/iShield_Key_Management_Kit_Linux.zip
- Download iShield Key Management Kit (macOS)

  https://www.swissbit.com/files/public/ikm/iShield_Key_Management_Kit_macOS.zip

Each of the zip files contains the iShield Key Manager User Manual, the installer package for each OS and Command Line Interface for each OS.

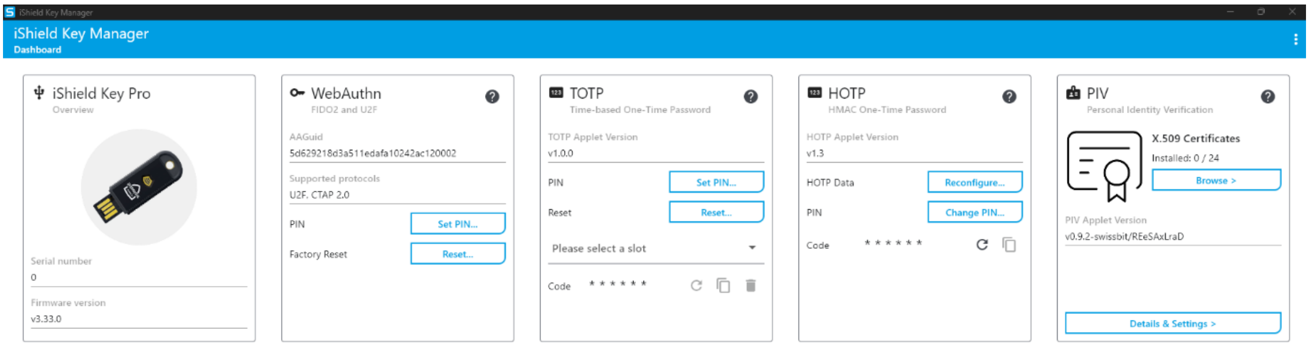
5.2 Initial Key Setup

Open iKM: Start the iShield Key Manager on your computer.

Select applet: Select the applet (WebAuthn, TOTP, HOTP or PIV) that you want to set up.

Set PIN: Enter a personal PIN for the selected applet and confirm it.

Repeat: Repeat the steps for each applet you want to use.



iShield Key Manager
Dashboard

iShield Key Pro
Overview
Serial number: 0
Firmware version: v3.33.0

WebAuthn
FIDO2 and U2F
AAGuid: 5d629218d3a511edafa10242ac120002
Supported protocols: U2F, CTAP 2.0

TOTP
Time-based One-Time Password
TOTP Applet Version: v1.0.0
Code: * * * * * *

HOTP
HMAC One-Time Password
HOTP Applet Version: v1.3
Code: * * * * * *

PIV
Personal Identity Verification
X.509 Certificates
Installed: 0 / 24
PIV Applet Version: v0.9.2-swissbit/REeSAxLraD

There are different "applets" depending on the iShield Key model – WebAuthn, TOTP, HOTP and PIV. The WebAuthn, TOTP and PIV applets must be set up before they are used for the first time. To do this, open the iKM (iShield Key Manager) on the computer and set the personal PINs for each applet. These PINs must be entered for each authentication, which is done by an automatic query from the computer.

Note that in order to manage the WebAuthN applet on Windows, the iShield Key Manager must be **Run as Administrator**.

6 iShield Key Functions

6.1 FIDO2

FIDO (Fast Identity Online) is an initiative that aims to revolutionize the way we authenticate ourselves online. At its core, it is about replacing passwords with more secure and user-friendly methods (e.g. passkeys)

6.1.1 FIDO2 and U2F: The building blocks

FIDO2: Enables passwordless login to websites and apps through the use of unique, device-bound security keys to deliver passwordless authentication.

U2F (Universal Second Factor): A part of FIDO2 that focuses on the use of physical security keys as a second level of authentication in addition to the password. These keys are often connected to the device via USB or NFC and provide an additional layer of security.

6.1.2 How does it work?

Registration: You register your iShield Key with an online service.

Authentication: When logging in, the website requests confirmation of your key. This is done by simply inserting the iShield Key, after which you are asked to confirm the key by touching it.

Confirmation: Your device or key cryptographically confirms your identity without transmitting sensitive data over the Internet. The actual PIN and private key never leaves the key.

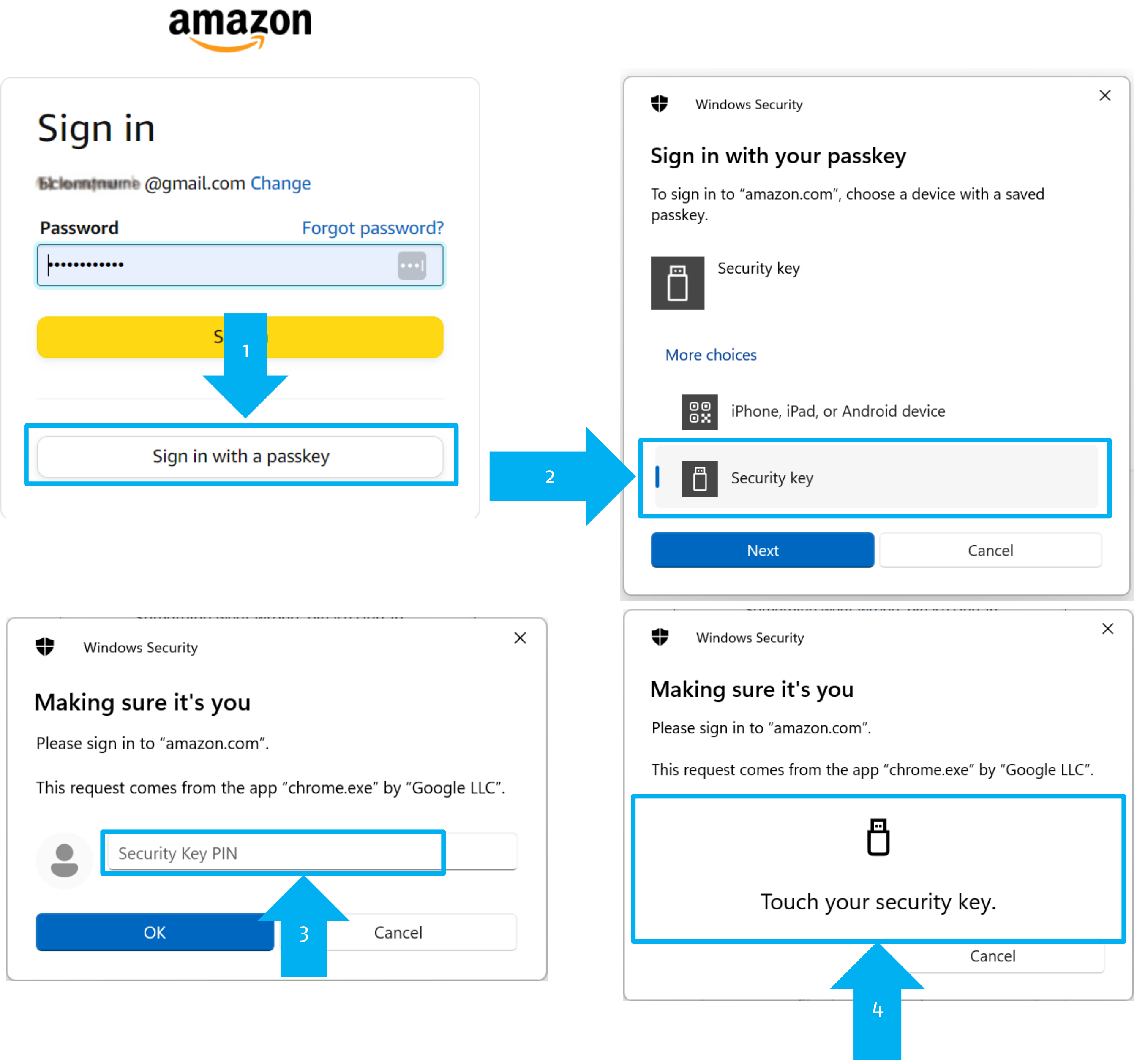
6.1.3 Broad acceptance

FIDO is supported by a large number of companies and organizations, including big names such as Google, Microsoft, Apple and many banks. The standards are supported in modern web browsers (Chrome, Firefox, Edge, etc.) and operating systems (Windows, macOS, Android, iOS). Confirmation is done by plugging in via USB or NFC (similar to contactless payment with a card).

6.1.4 Security benefits of FIDO2

FIDO2 is considered more secure than conventional password-based systems as it uses public key cryptography and reduces the risk of phishing attacks. No sensitive data is transmitted during authentication, which further increases security.

6.1.5 Login with FIDO2 – "Passkey"



Sign in

[redacted] @gmail.com Change

Password: ••••••••••••

Windows Security

Sign in with your passkey

To sign in to “amazon.com”, choose a device with a saved passkey.

Windows Security

Making sure it's you

Please sign in to “amazon.com”.

This request comes from the app “chrome.exe” by “Google LLC”.

Windows Security

Making sure it's you

Please sign in to “amazon.com”.

This request comes from the app “chrome.exe” by “Google LLC”.

Touch your security key.

6.2 OTP

An OTP (One-Time Password) is like a secret code that is only valid once. Imagine you want to use your online banking. In addition to your normal password, you also receive an OTP, for example by text message on your cell phone. This code is only valid for a short time (often 30 seconds or one minute). When you enter it, you prove that you are really you and not someone who only knows your password.

6.2.1 Why is it more secure?

Protects against password theft: Even if someone finds out your password, they cannot log in because they do not have the additional OTP code.

Always different: The OTP changes every time you log in, so it cannot simply be guessed or reused.

Additional security: The OTP provides a second layer of protection in addition to your password.

6.2.2 Different OTP methods

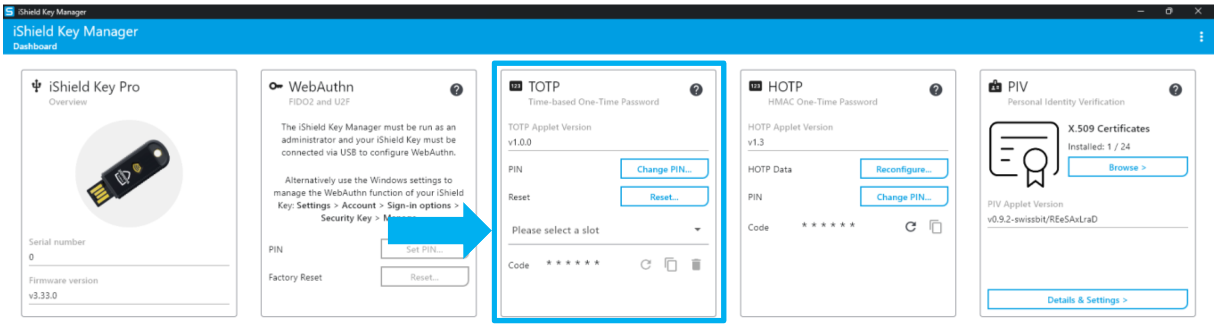
HOTP (HMAC-based One-Time Password): Generates OTPs based on a counter value. The code changes each time a new OTP is requested.

TOTP (Time-based One-Time Password): Generates OTPs based on the current time. These codes are only valid for a short time (often 30 or 60 seconds).

6.2.3 How do I get an OTP?

Via NFC: The code is displayed on your Android smart phone. (iShield Key Manager app required)

Via USB: The code is displayed on the computer. (iShield Key Manager app required)



Serial number
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Firmware version
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Alternatively use the Windows settings to manage the WebAuthn function of your iShield Key: **Settings** > **Account** > **Sign-in options** > **Security Key** > **Manage**

PIN

Factory Reset

TOTP Applet Version
v1.0.0

PIN

Reset

Please select a slot

Code ******

HOTP Applet Version
v1.3

HOTP Data

PIN

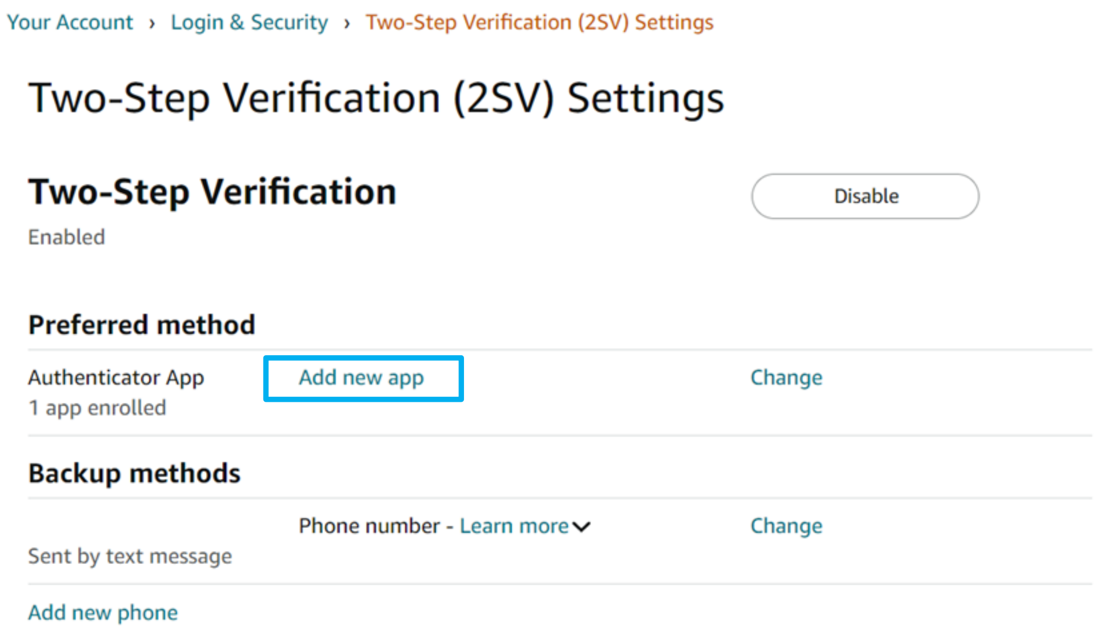
Code ******

Installed: 1 / 24

PIV Applet Version
v0.9.2-swissbit/REeSAxLraD

6.2.4 Example Amazon on the computer:

Amazon: My Account -> Login and Security -> 2SV 2 Step Verification (2FA, 2 Factor Authentication)


Your Account › Login & Security › Two-Step Verification (2SV) Settings
Disable
Add new app
Change
Change
Learn more
Add new phone

Two-Step Verification (2SV) Settings

Two-Step Verification

Enabled

Preferred method

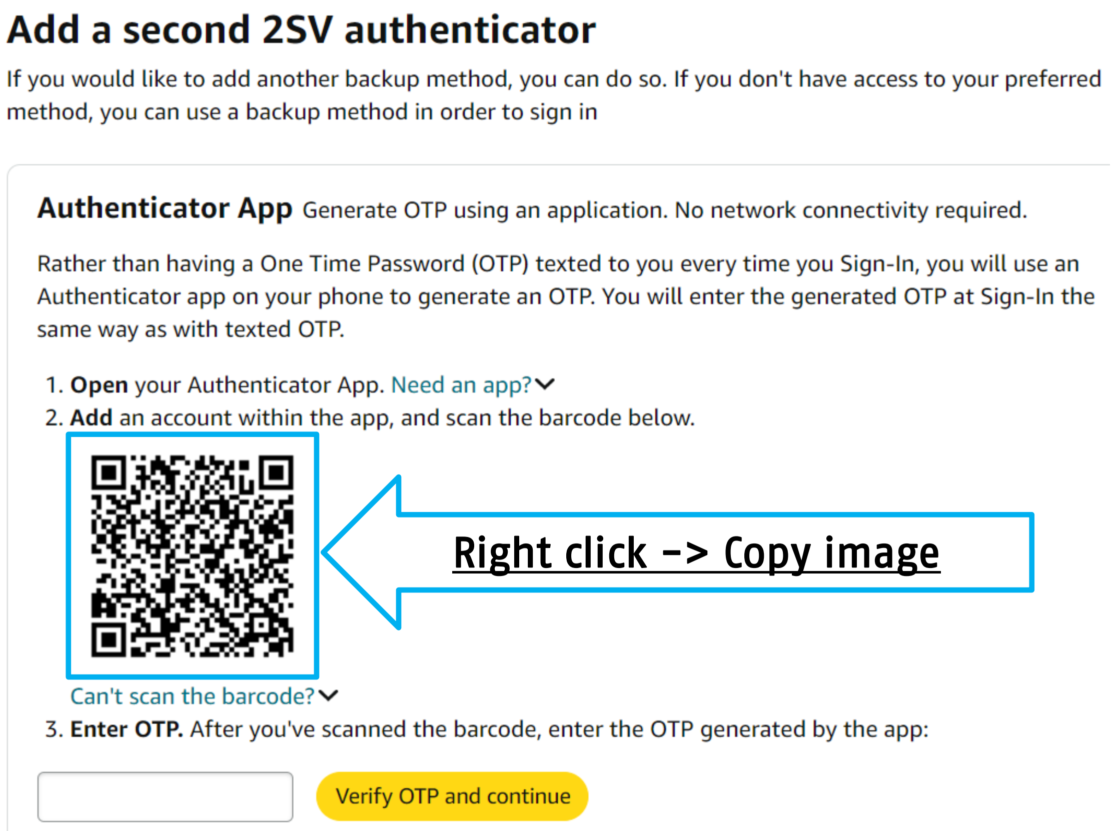
Authenticator App

1 app enrolled

Backup methods

Phone number - Learn more

Sent by text message



Add a second 2SV authenticator

If you would like to add another backup method, you can do so. If you don't have access to your preferred method, you can use a backup method in order to sign in

Authenticator App Generate OTP using an application. No network connectivity required.

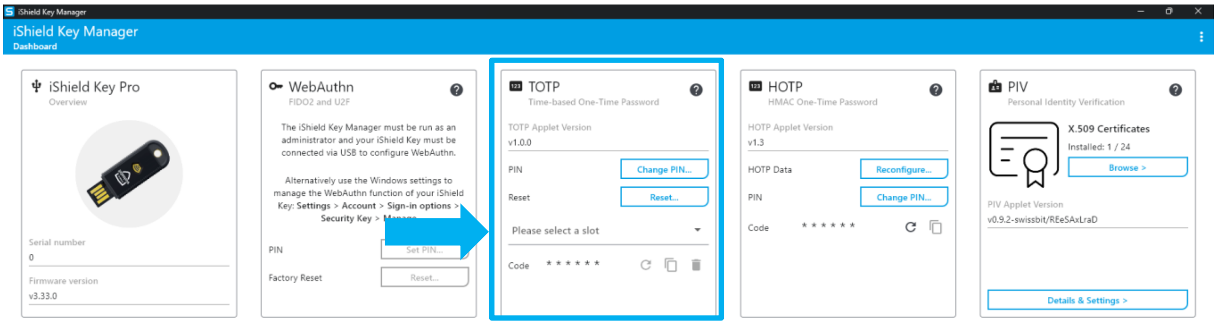
Rather than having a One Time Password (OTP) texted to you every time you Sign-In, you will use an Authenticator app on your phone to generate an OTP. You will enter the generated OTP at Sign-In the same way as with texted OTP.

1. **Open** your Authenticator App. Need an app?
2. **Add** an account within the app, and scan the barcode below.

Can't scan the barcode?

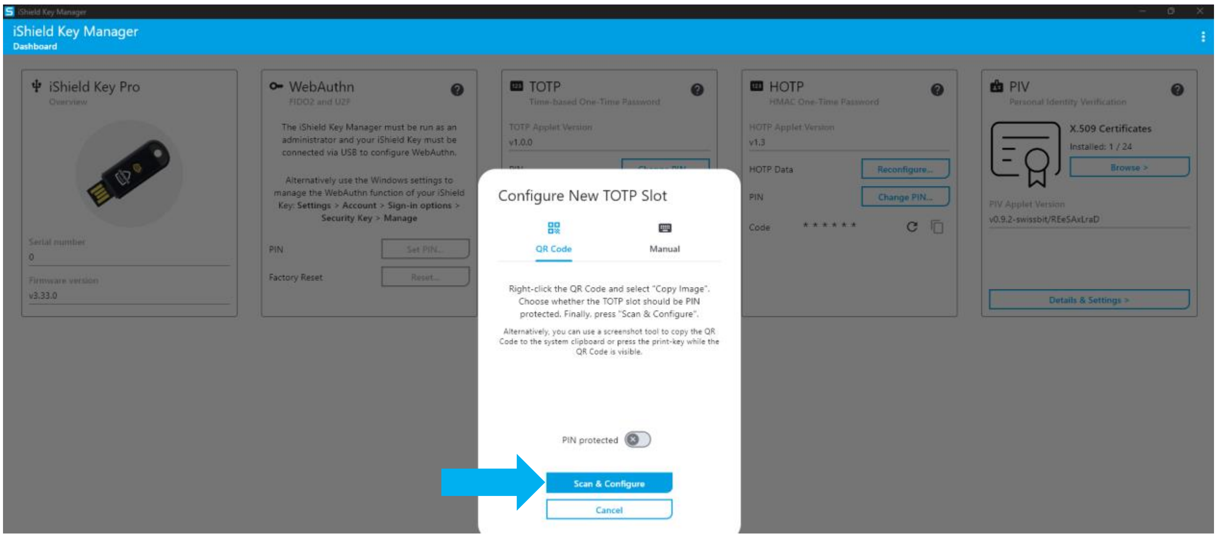
3. **Enter OTP.** After you've scanned the barcode, enter the OTP generated by the app:

Right click -> Copy image



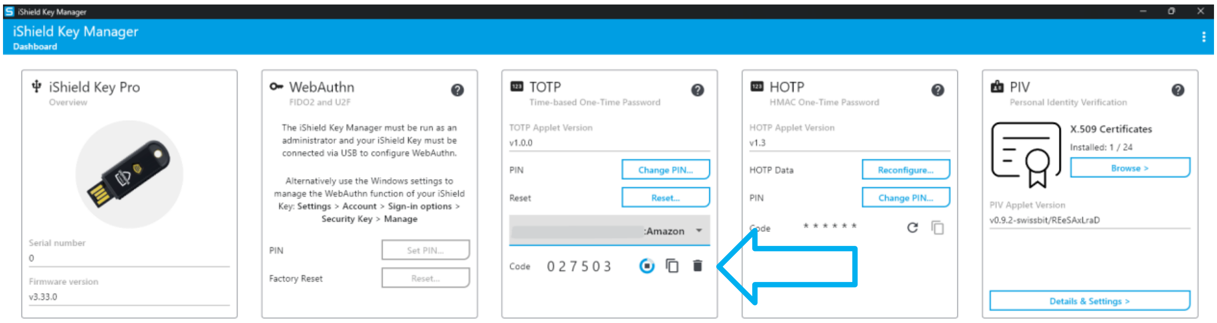
The iShield Key Manager must be run as an administrator and your iShield Key must be connected via USB to configure WebAuthn.

Alternatively use the Windows settings to manage the WebAuthn function of your iShield Key: **Settings** > **Account** > **Sign-in options** > **Security Key** > **Manage**



Right-click the QR Code and select "Copy Image". Choose whether the TOTP slot should be PIN protected. Finally, press "Scan & Configure".

Alternatively, you can use a screenshot tool to copy the QR Code to the system clipboard or press the print-key while the QR Code is visible.



Copy the code and confirm it on Amazon. Finished

6.2.5 How can I see this code on my cell phone?

Download iShield Key Manager for the Android device (iOS not yet available)

Hold the iShield Key to the **back of** the smartphone

After the first successful connection, you will receive an overview of all OTP accounts.

When the account is selected, a request appears to hold the key to the device again.

7 How the iShield Key Improves Security:

7.1 Physical security

Uniqueness: Hardware security devices are physical objects that cannot be easily copied or stolen.

Independence: They work independently of the operating system of the computer or mobile device, which makes them less susceptible to software-based attacks.

7.2 Strong authentication

Two-factor authentication (2FA): Hardware security devices such as the iShield Key provide an additional layer of security by being used as a second factor alongside the password.

Passwordless authentication: The iShield Key also supports passwordless login, which eliminates the risk of password theft.

7.3 Protection against phishing

Challenge-based authentication: These devices use cryptographic key pairs for authentication, making them immune to phishing attacks. Even if a user clicks on a malicious phishing link, the attacker cannot log in without the physical key.

7.4 Cryptographic security

Private key remains secure: The private key is securely stored on the device and never leaves the device, protecting it from malware and other malicious programs.

Strong encryption: Hardware security devices use advanced cryptographic methods to ensure security.

7.5 Compatibility and support

Broad support: The iShield Key is compatible with many common operating systems, browsers and online services. This facilitates integration and use.

Standards: They support open standards such as FIDO2 and U2F

7.6 Easy handling

Ease of use: These devices are often easy to use. They only need to be plugged into a USB port or held wirelessly to the device (e.g. NFC) to work.

No installation necessary: In most cases, no special drivers or software installations are required, making it easy to use.

7.7 PIV

The iShield Key Pro supports industry standards developed for PKI smart card authentication to operating systems (Windows, MacOS, Linux) to enable certificate-based login to these systems. The iShield Key Pro is detected as both a smart card reader and a compliant smart card containing the public/private key-pairs and certificates required for authentication, code signing and encryption.

8 Why iShield Key?

8.1 iShield Key vs SMS & E-Mail 2FA

Vulnerabilities of SMS-based 2FA:

- **Phishing attacks:** Scammers can create fake websites or messages that look like they come from your real provider. They trick you into entering your OTP (one-time password) and can then access your account.
- **SIM swap attacks:** Criminals can trick your mobile provider into transferring your phone number to a new SIM card. This allows them to receive your SMS messages, including OTPs, and take over your accounts.

Vulnerabilities of email-based 2FA:

- **Phishing attacks:** Similar to SMS, fraudsters can send fake emails to trick you into revealing your OTP.
- **Email account compromise:** If your email account is hacked, the attacker will have access to all your emails, including OTPs.

How iShield Key offers a more secure alternative:

iShield Key is a physical security key that serves as a second level of authentication. It is connected to your device via USB or NFC and generates OTPs without an internet connection. This makes it resistant to phishing and SIM swap attacks.

Advantages of iShield Key:

- **Physical protection:** The key must be physically present in order to generate OTPs. This makes it difficult for attackers to steal or duplicate it.
- **No internet connection required:** As the key works offline, it is not vulnerable to phishing attacks that rely on intercepting messages.
- **Easy to use:** The key can be activated simply by tapping it and immediately generates an OTP.

8.2 Are iShield keys un-hackable?

The iShield Key is very secure and offers strong protection for your data and online accounts. However, it is important to be aware that no device is completely invulnerable. By using the key in combination with other security measures, you can significantly improve your online security.

The iShield Key FIDO2 and iShield Key Pro are not susceptible to side-channel attacks that have been reported as a vulnerability in mid-2024. Swissbit has replaced the secure element that remains vulnerable in devices supplied by other vendors.

9 Change History

Date	Revision	Details
10.10.2024	1.0	Initial release

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