



Firmware Update Guide

AH52126_FU01E_01

2023-01-18

Axell

Trademarks and licenses

Company, product, or service names mentioned herein are trademarks or registered trademarks of their respective owners.

Trademarks or registered trademarks of respective companies

- FIDO® is a trademark or registered trademark of FIDO Alliance, Inc.
- Linux® is a registered trademark of Linus Torvalds in the United States and other countries.
- Mac and macOS are registered trademarks of Apple Inc. in the United States and other countries.
- Windows are trademarks or registered trademarks of Microsoft Corporation in the United States and other countries.
- SHALO is a trademark or registered trademark of Axell Corporation.

All other company and product names are generally trademarks or registered trademarks of their respective companies.

Contact information

If you need support for this product or have any inquiries about it, please email us at shalo@axell.co.jp.

Revision History

Document Number	Date	Page	Description
AH52126_FU01E_01	2023-01-18		Initial Release

Conventions used in this manual

Styles and formats

In addition to regular styles, this manual uses the following styles for special purposes:

- Bold** Indicates important information in running text and character strings provided by the user at the terminal.
- Italic* Indicates information that varies depending on the user's environment.
- mono** Indicates command names and command options.

The following format shows a single command line:

```
command -p environment-specific-string
```

The following format shows input and output in the terminal command prompt:

```
$ command↵  
Message
```

Special characters used in the above prompt have the following meanings:

- > Indicates the PowerShell prompt.
- \$ Indicates the Bash prompt. It is used in Linux, and macOS 10.14 Mojave or earlier.
- % Indicates the Zsh prompt. It is used in macOS 10.15 Catalina or later.
- ↵ Indicates pressing the Enter key.

Symbols used in this manual



Indicates reference or supplemental information.



Indicates an important note.

Contents

Conventions used in this manual	3
Contents	4
Chapter 1 Updating the firmware	5
1.1 What is needed before updating the firmware?	6
1.1.1 Add other authentication methods to services that use SHALO AUTH.....	6
1.1.2 Remember and unlock the SO PIN (only if SHALO AUTH has been set).....	6
1.1.3 Terminate the applications that are using SHALO AUTH.....	6
1.2 How to launch the firmware updater	7
1.2.1 Launch on Windows.....	7
1.2.2 Launch on macOS	7
1.2.3 Launch on Linux	8
1.3 Step-by-step procedure.....	9
Chapter 2 Firmware version history	11

Chapter 1

Updating the firmware

This chapter explains how to update the firmware of SHALO AUTH.

Firmware updates can be performed from the following operating systems.

- Windows
- macOS
- Linux

Topics in this chapter

1. What is needed before updating the firmware?
2. How to launch the firmware updater
3. Step-by-step procedure

1.1 What is needed before updating the firmware?

1.1.1 Add other authentication methods to services that use SHALO AUTH

When SHALO AUTH is restored to the factory settings, all the following information is removed:

- SO PIN
- User PIN
- Device label
- All PKCS #11 data
- All FIDO authentication keys



All the FIDO authentication keys used for U2F will be removed, so the device will be recognized as an unregistered even by Web services that have previously registered the device.

If you are using SHALO AUTH for Web services or ssh authentication, **you need to add a different authentication method than SHALO AUTH** so that you can authenticate without SHALO AUTH.

1.1.2 Remember and unlock the SO PIN (only if SHALO AUTH has been set)

If SHALO AUTH has been set, SO PIN must be entered when updating the firmware; if SO PIN is forgotten or SO PIN is locked, firmware update cannot be performed.

In such cases, SHALO AUTH must be restored to the factory settings with SHALO Smith. See section 5.3 “Restoring SHALO AUTH to the factory settings” of SHALO AUTH User Manual for operating instructions.



Firmware update can be performed without SO PIN if SHALO AUTH has not been set with SHALO Smith or SHALO Keyring.

This is also the case when SHALO AUTH has been restored to factory settings.

1.1.3 Terminate the applications that are using SHALO AUTH

Terminate the applications that are using SHALO AUTH, such as SHALO Keyring or SHALO Smith. The same goes for applications that use the PKCS #11 module for SHALO AUTH.

If the PKCS #11 module is loaded in ssh-agent, the authentication agent of OpenSSH, the module must be unloaded from ssh-agent.

1.2 How to launch the firmware updater

1.2.1 Launch on Windows

The firmware updater for Windows can be downloaded from <https://auth.shalo.jp>. To launch it, do the following.

First, attach one SHALO AUTH to your PC.

Then, run the shaloauth_updater_1.6_windows.exe file you downloaded (where 1.6 indicates the version number) from PowerShell as follows.

```
PS C:\> Download-Folder\shaloauth_updater_1.6_windows.exe ↵
```



To easily enter the file path, drag and drop shaloauth_updater_1.6_windows.exe from your download folder into the PowerShell window.

See section 1.3 for further operations.

1.2.2 Launch on macOS

The firmware updater for macOS can be downloaded <https://auth.shalo.jp>. To launch it, do the following.

First, attach one SHALO AUTH to your PC.

Next, double-click on the downloaded shaloauth_updater_1.6_macos.dmg file (where 1.6 indicates the version number). The SHALO_AUTH_UPDATER_v1.6 window will then appear.

And finally, run shaloauth-updater-v1_6 in the SHALO_AUTH_UPDATER_v1.6 window from Terminal as follows:

```
% /Volumes/SHALO_AUTH_UPDATER_v1.6/shaloauth-updater-v1_6 ↵
```



To easily enter the file path, drag and drop shaloauth-updater-v1_6 from the SHALO_AUTH_UPDATER_v1.6 window into a Terminal window.

See section 1.3 for further operations.

1.2.3 Launch on Linux

The firmware updater for Linux can be downloaded <https://auth.shalo.jp>. To launch it, do the following.

First, attach one SHALO AUTH to your PC.

Then, extract the shaloauth_updater_1.6_linux.tar.gz file you downloaded (where 1.6 indicates the version number). In the Terminal, go to the folder where the file is stored, and execute the following command:

```
$ tar xvfz shaloauth_updater_1.6_linux.tar.gz ↵  
shaloauth-updater-v1_6
```

And finally, run the extracted shaloauth-updater-v1_6 from Terminal as follows:

```
$ ./shaloauth-updater-v1_6 ↵
```

If an udev rules file for SHALO AUTH is not installed on Linux, the following warning message will appear when a non-root user runs the firmware updater.

```
[WARN  ] SHALO AUTH not found. Please attach one SHALO AUTH device to the  
PC.  
Update canceled.
```

In such a case, use `sudo` command as follows.

```
$ sudo ./shaloauth-updater-v1_6 ↵  
[sudo] password for user: Enter-your-password ↵
```

See section 1.3 for further operations.

1.3 Step-by-step procedure

An example of updating firmware with the firmware updater is shown below. Here is a step-by-step procedure to follow along with this example.

```
SHALO AUTH firmware ver.1.6 updater (1.0.0.1)
Copyright (C) 2023 AXELL CORPORATION. All rights reserved.

SHALO AUTH can be updated. ver.1.5 -> ver.1.6

=====
                        CAUTION
=====

  PINs and all keys of SHALO AUTH will be erased.
  All FIDO U2F authentication keys will also be deleted.

  DO NOT shutdown or sleep your PC during updating.

=====

Are you sure to update the firmware? [y/n]: y↵
SO PIN: Input the SO PIN↵
Writing firmware ..... done!
Verifying firmware .. done!
Updated successfully!
```

The firmware updater checks the status of SHALO AUTH and outputs the following message according to the result.

Messages
SHALO AUTH can be updated. ver.X.Y-> ver.A.B
Current firmware is ver.X.Y. No update is needed.
[WARN] SHALO AUTH not found. Please attach one SHALO AUTH device to the PC.
[WARN] Found <i>Number</i> SHALO AUTH devices; only one should be attached.
[ERROR] SHALO AUTH is being used by another app.

If SHALO AUTH can be updated, the updater outputs as shows below. Enter **n** to cancel the update or **y** to continue, then press ENTER.

```
=====
                        CAUTION
=====

  PINs and all keys of SHALO AUTH will be erased.
  All FIDO U2F authentication keys will also be deleted.

  DO NOT shutdown or sleep your PC during updating.

=====

Are you sure to update the firmware? [y/n]:
```

Updating the firmware will remove the following information:

- SO PIN and user PIN
- Device label
- All PKCS #11 data
- All FIDO authentication keys



All the FIDO authentication keys used for U2F will be removed, so the device will be recognized as an unregistered even by Web services that have previously registered the device.



Do not remove SHALO AUTH from your PC until the firmware update is completed. Also, never allow the PC to sleep or shut down.

If SHALO AUTH has been set, you will be prompted to enter the SO PIN. If the following is appeared, enter the SO PIN and press ENTER.

SO PIN:



If the authentication of the SO PIN fails, the firmware update will be canceled. The SO PIN is also locked after a certain number of failed authentication attempts.



If the SO PIN has been locked, the following message appears.
[ERROR] SO PIN has been locked. Restore your SHALO AUTH to the factory settings.

SHALO AUTH blinks the LED during the firmware update. Finally, if the firmware update is successful, the firmware updater will exit with the following output.

```
Writing firmware ..... done!  
Verifying firmware .. done!  
Updated successfully!
```

After the message is shown, SHALO AUTH can be removed from your PC.

Chapter 2

Firmware version history

This chapter summarizes the changes made to each version of the SHALO AUTH firmware.

Version	Date	Description
1.5		Initial Release
1.6	2023-01-18	<ul style="list-style-type: none">● Resolve the issue where SHALO AUTH does not wake up from sleep when SHALO AUTH is disconnected from the host OS.● Resolve the issue where SHALO AUTH does not wake up from sleep when using SHALO AUTH through certain self-powered USB hubs, if the USB hub is disconnected from the PC.

Cautions

- The contents of this document (i.e., this “Cautions”) and specification (i.e., this “Specification”) are current as of January 2023.
- Transfer or duplication of part or all of this Specification without permission from AXELL is prohibited.
- When using the product described in this Specification (i.e., “the Product”), please use it correctly according to the contents of this Specification.
- ABSENT A WRITTEN SIGNED AGREEMENT, EXCEPT AS PROVIDED IN THE RELEVANT TERMS AND CONDITIONS OF SALE FOR THE PRODUCT, AND TO THE MAXIMUM EXTENT ALLOWABLE BY LAW, AXELL (1) ASSUMES NO LIABILITY WHATSOEVER, INCLUDING WITHOUT LIMITATION, INDIRECT, CONSEQUENTIAL, SPECIAL, OR INCIDENTAL DAMAGES OR LOSS, INCLUDING WITHOUT LIMITATION, LOSS OF PROFITS, LOSS OF OPPORTUNITIES, BUSINESS INTERRUPTION AND LOSS OF DATA, AND (2) DISCLAIMS ANY AND ALL EXPRESS OR IMPLIED WARRANTIES AND CONDITIONS RELATED TO SALE, USE OF THE PRODUCT, OR INFORMATION, INCLUDING WARRANTIES OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, ACCURACY OF INFORMATION, OR NONINFRINGEMENT.
- AXELL will not be held liable for any opportunity losses, indirect damages due to irregularities or defects of the Product, or semiconductor device damages when using the Product at a value exceeding the absolute maximum rating.
- The application examples and constants shown in this Specification are provided to explain the standard operation and usage of the Product. During mass-production design, take external conditions into consideration. The incorporation of the Product in the design of a customers’ equipment shall be done under the full responsibility of the customers.
- The product application examples, information, and data in this Specification are provided only as examples and do not imply any guarantee related to intellectual property rights such as patent rights or copyrights of third parties or any other rights. Therefore, AXELL assumes no responsibility with regard to (1) infringement of intellectual property rights of third parties, or (2) any consequences arising from the use of the Product.
- While AXELL always strives to improve the quality of the Product, the possibility of defects cannot be eliminated entirely. To minimize risks of damage to property or injury (including death) to persons arising from defects in the Product, customers must incorporate sufficient safety measures in their design, such as redundancy, fire-containment, over current prevention and anti-failure features.
- While AXELL endeavors to make the information contained in this Specification complete, this Specification does not cover every possible phenomenon. If there is any risk of malfunctions due to compliance with this Specification, customers must take appropriate measures, such as consulting AXELL in advance. Customers should note that AXELL will not necessarily be held liable for reparation or compensation even if the contents of this Cautions and/or Specification were complied with by the customer.
- The Product is intended for use in general electronic equipment such as audio visual systems, office automation equipment, communication equipment, home electric appliances and amusement equipment. The product is not intended for use in equipment and/or systems (a) which may directly affect human lives (including, without limitation, life support systems) and (b) which require extremely high reliability and whose failure or malfunction may cause enormous damage (including, without limitation, transportation equipment control unit, nuclear control systems, military equipment), and Customers shall not use the Product for those equipment and/or systems. Customers shall consult AXELL sales representative in advance if they should consider use of the Product in the said equipment and/or systems.
- The company names and the product names used in this document are generally trademarks or registered trademarks of respective companies.

Axell

Axell Corporation

Akihabara UDX SouthWing 10F 4-14-1

Sotokanda, Chiyoda-ku, Tokyo

TEL +81-3-5298-1670 FAX +81-3-5298-1671

<https://www.axell.co.jp/>