UM0007
User Manual

AT-Link Console User Manual

Introduction

This user manual gives an overview of AT-Link Console. AT-Link Console is a command-line application based on AT-Link. With the help of this software, users can configure ARTERY MCU devices through SWD ports.

List of applicable Artery MCUs:

Part number	AT32F series

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1 Introduction

1.1 Environmental requirements

- **Software resources**

  Windows OS

  Windows 7 and above.

  No driver is required when using AT-Link debugger.

  Linux OS

  Linux OS with x86_64 architecture, such as Ubuntu, Federa, etc.

- **Hardware resources**

  AT-Link debugger

  USB communication port.

1.2 Glossary

- **AT-Link debugger**

  AT-Link is a debugger, released by ARTERY, for the sake of MCU development.

2 Installation

- **Hardware installation**

  Step 1: Connect AT-Link debugger to the USB port of PC.

  Step 2: Connect AT-Link debugger to the ICE interface of the target evaluation board.

- **Software installation**

  This software doesn’t need to be installed, just run the executable program directly.

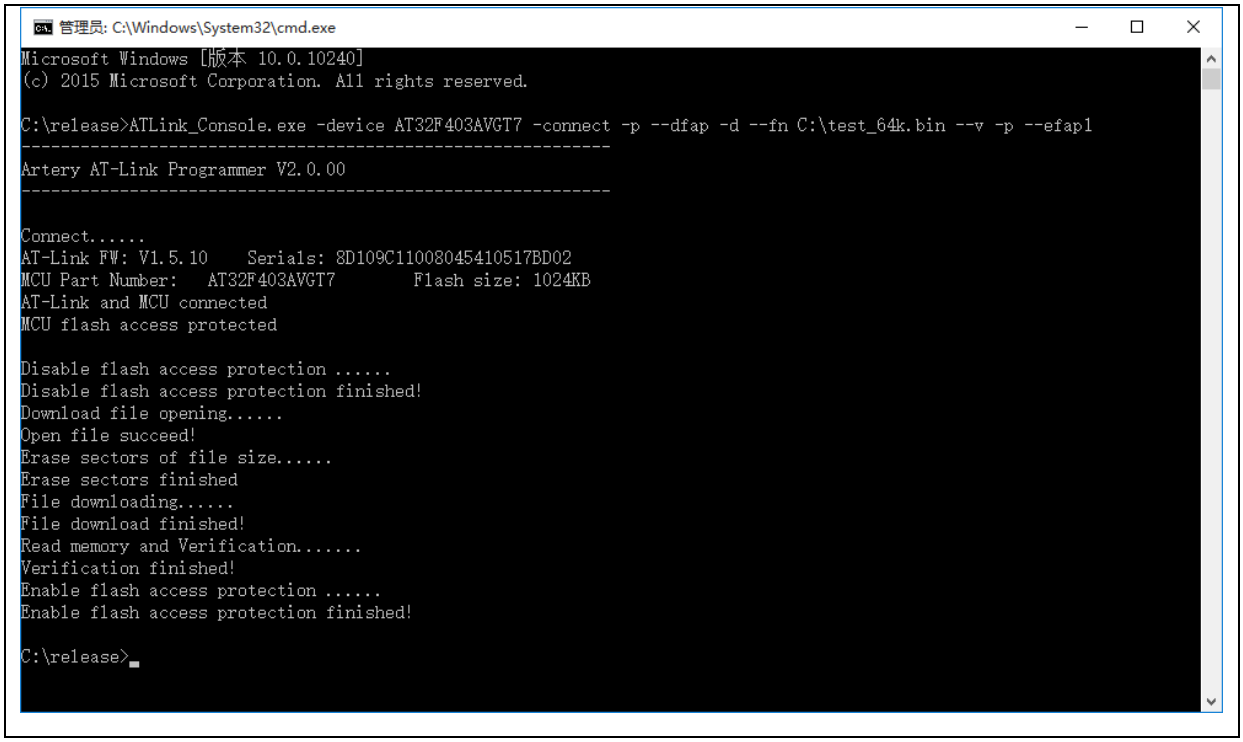
3 Software operation

3.1 Operating mode

3.1.1 Used in Windows

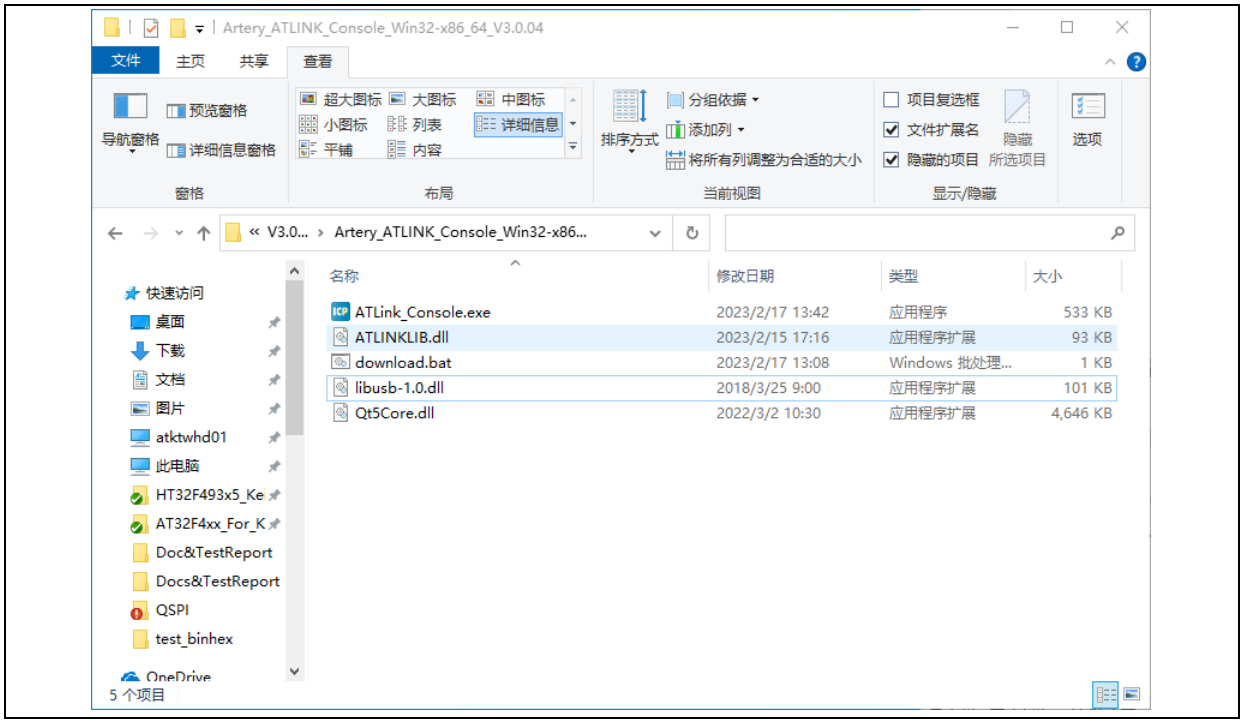
Mode 1: Input parameters on the command line

Figure 1 Command line window



Mode 2: Batch file processing (Refer to DFU_download.bat for details on common operations)

Figure 2 Batch file processing



3.1.2 Used in Linux

1. The executive program “ATLink_Console” and the script “ATLink_Console.sh” needs an execution permission.
   Command: chmod +x ATLink_Console ATLink_Console.sh
2. Edit the script “download.sh”, add operation steps based on command line parameters shown in Section 4.2 (Seedownload.sh in the example) and give an execution permission.
   Command: chmod +x download.sh
3. To execute the script download.sh in the terminal, a sudo is required, for either a serial interface or USB device needs a root user authority.
   Command: sudo ./download.sh

Figure 3 Linux OS

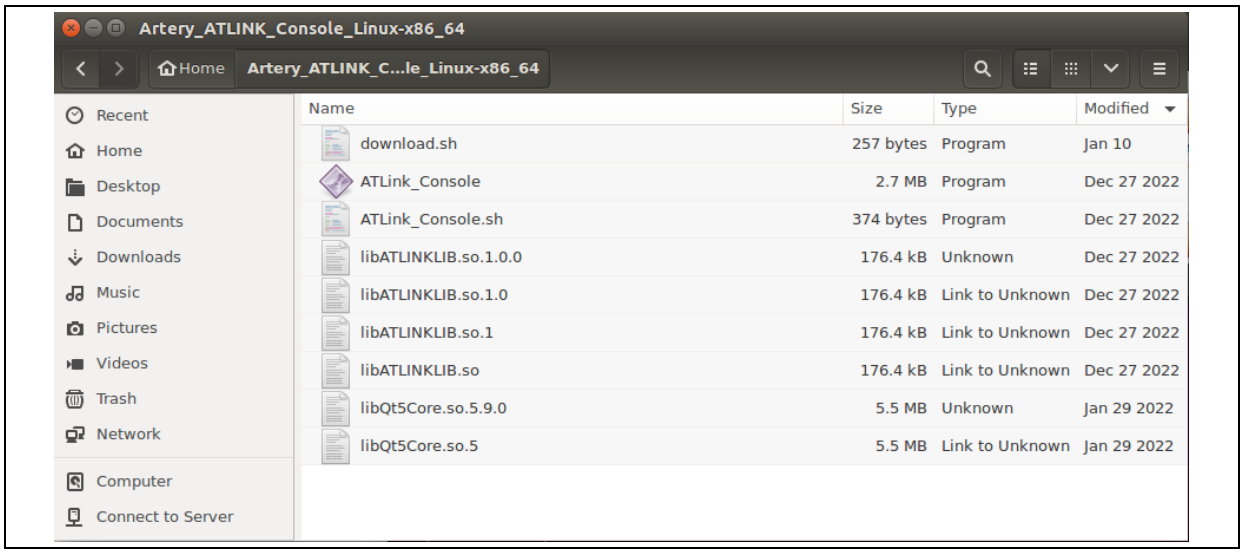
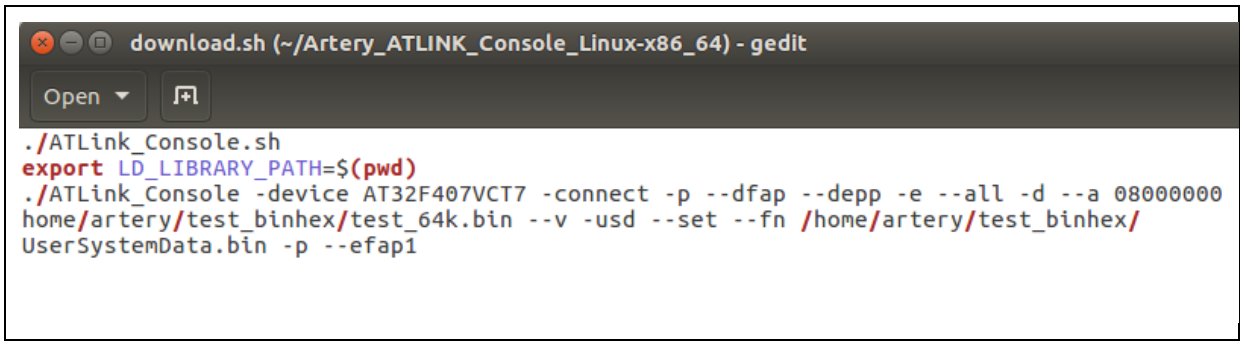


Figure 4 Shell script file



3.2 Command line parameters

Table 1 List of command line parameters

Command	Sub Command	Remarks
-?		Show the help.
-sn		Specify the serial number of the AT-Link to connect to, e.g A3181500008051151 3954D07.
-device		Set device, e.g. AT32F403ARGT7. You must set device when the device access protection.
-connect		Establish connection.
-e		Erase flash.
	--all	Erase all sectors of flash, spim (spim enabled), boot memory(AP mode enabled).
	--flash	Erase all sectors of flash. (--all --flash)
	--spim	Erase all sectors of SPIM. (--all --spim)
	--bootm	Erase all sectors of boot memory. (--all --bootm)
	--sec n-m	Erase selected sectors, begin sector-end sector, e.g. 0-20.
-eble		Erase BLE module flash.
	--all	Erase all sectors of BLE module flash.
	--main	Erase all sectors of main code space. (--all --main)
	--nvr	Erase all sectors of NVR space. (--all --nvr)
	--rdn	Erase all sectors of RDN space. (--all --rdn)
	--sec n-m	Erase selected sectors of main space, begin sector-end sector, e.g. 0-20.
-u		Upload flash contents to the specified file.
	--sec n-m	Upload selected sectors, begin_sector-end_sector, e.g. 0-20.
	--fn file_name	Full path name (bin, hex file; the file type is recognized by its extension).
-uble		Upload BLE module main code space flash contents to the specified file.
	--sec n-m	Upload selected sectors, begin_sector-end_sector, e.g. 0-20.
	--fn file_name	Full path name (bin, hex file; the file type is recognized by its extension).
-d		Download the content of the specified file into flash

Command	Sub Command	Remarks
	--a address(hex)	Start address, default 0x08000000; ignored if the target file is not a binary file.
	--fn file_name	Full path name (bin/hex file; the file type is recognized by its extension).
	--v	Verify after download.
	--ne	Don't erase sector before downloading file.
-p		Enable or disable protection.
	--efap1	Enable access protection, all options following this one will fail.
	--efap2	Enable high level access protection, all options following this one will fail.
	--y	If the MCU is AT32F425/F423/L021/F402/F405/F490/M412/M416, you must enter "--y" for confirmation. (--efap2 --y)
	--dfap	Disable flash access protection.
	--depp	Disable erase and program protection.
	--eepp n-m	Enable erase and program protection for sector codes, begin_sector-end_sector, e.g. 0-20.
	--ebfap	Enable BLE module access protection.
	--dbfap	Disable BLE module access protection.
-usd		Set user system data to MCU.
	--get --fn file_name	Get user system data from the device and write it in the specified file, full path name (bin/hex file, the file type is recognized by its extension).
	--set	Load user system data from the specified file and write it to the device.
	--key	Use the value of UID to automatically set QSPIKey..
	--fn file_name	Full path name (bin/hex file, the file type is recognized by its extension).
-otp		Download One-Time Programmable data.
	–fn file_name	Full path name (attp file).
-enspim		Enable to access SPIM.
	--ft type	SPIM flash type, value 1 or 2. Default value 1.
	--fs size	SPIM flash size (MB).
	--fda FA(hex)	SPIM FLASH_DA, hexadecimal.
	--remap 0/1	Remap IO pin used by SPIM. 0: remap0 (Use PA11/PA12 pins)

Command	Sub Command	Remarks
		1: remap1 (Use PB10/PB11 pins)
-bmapm		Set boot memory AP mode.
	--key value	Hexadecimal, must be 0xA35F6D24.
-w4		MCU debug mode, write 32-bit data.
	addr(hex)	The address of the data to be written, 32-bit address. e.g. 20000000.
	value(hex)	The value of the data to be written, 32-bit data. e.g. 00112233.
-w2		MCU debug mode, write 16-bit data
	addr(hex)	The address of the data to be written, 32-bit address. e.g. 20000000.
	value(hex)	The value of the data to be written, 16-bit data. e.g. 0011.
-mem32		MCU debug mode, read 32-bit data.
	addr(hex)	The address of the data to be read, 32-bit address. e.g. 08000000.
-mem16		MCU debug mode, read 16-bit data.
	addr(hex)	The address of the data to be read, 32-bit address. e.g. 08000000.
-r		Reset and run. When MCU access protection, this command is invalid.
-wsn		Write serial number.
	--ne	Don’t erase sector before writing serial number.

3.3 AT-Link Console return codes

In case of error, while executing AT-Link Console commands, the return code (Errrolevel) is greater than 0.

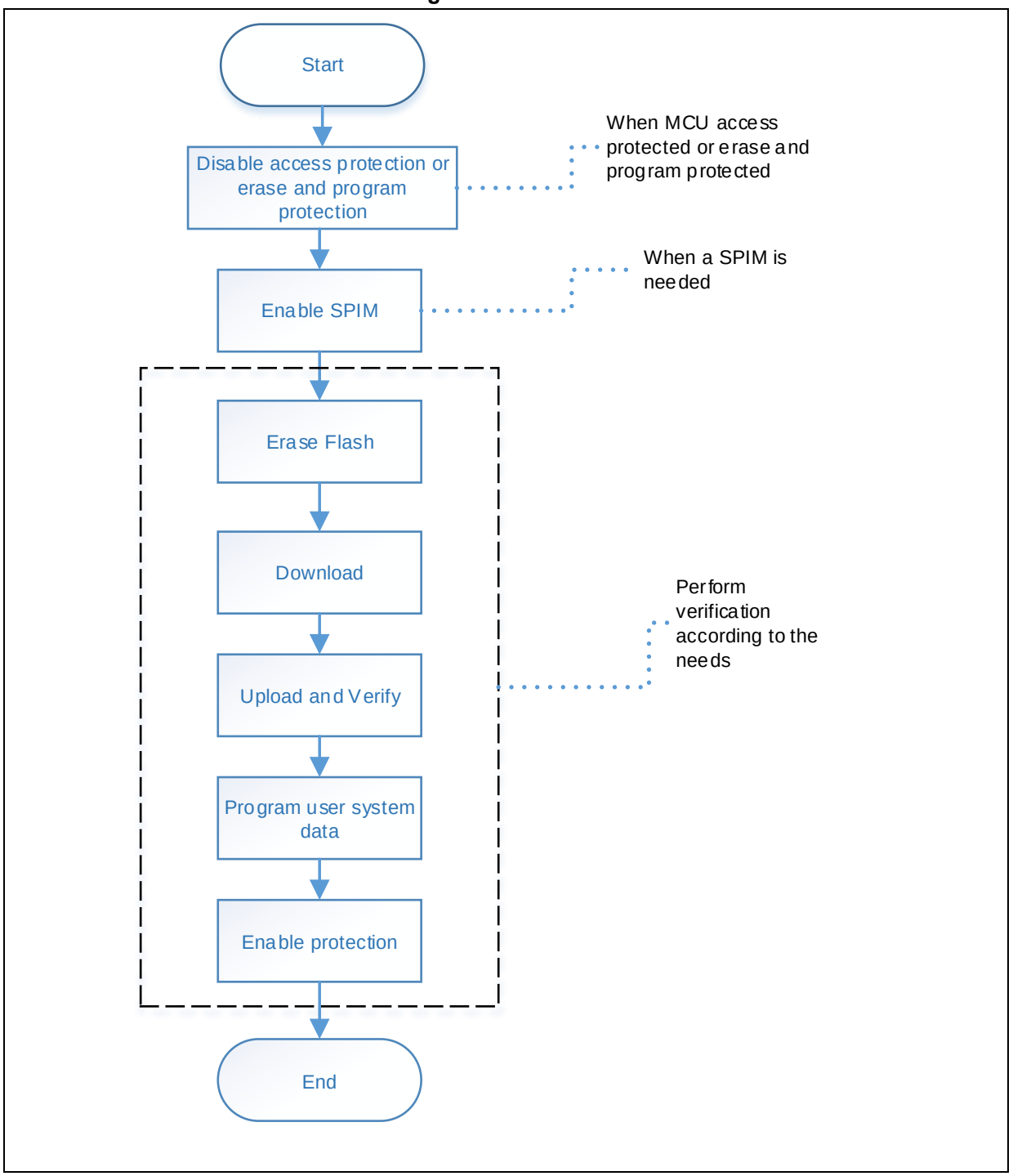
Table 2 List of return codes

Return code	Command	Error
0x00	All	Finished successfully
0x01	All	Command arguments error.
0x02	All	Connection problem.
0x03	-d	Flash memory programming/verification error.
0x04	-u	Failed to upload Flash memory contents

Return code	Command	Error
0x05	-uble	Failed to upload BLE module main code space Flash contents.
0x06	-usd	Failed to get user system data from the device.
0x07	-usd	Failed to write user system data to the device.
0x08	-enspim	Failed to enable SPIM.
0x09	-bmapm	Failed to set boot memory AP mode
0x0A	-w4/-w2	Error occurred while writing data to the specified flash address
0x0B	-mem32/-mem16	Error occurred while reading data from the specified flash address
0x0C	-r	Reset and run error.
0x0D	-wsn	Failed to write serial number.
0x20	-p --efap1	Failed to enable access protection.
0x21	-p --efap2	Failed to enable high level access protection.
0x22	-p --dfap	Failed to disable flash access protection.
0x23	-p --depp	Failed to disable erase and program protection.
0x24	-p --eepp	Failed to enable erase and program protection.
0x25	-p --ebfap	Failed to enable BLE module access protection.
0x26	-p --dbfap	Failed to disable BLE module access protection.
0x30	-e --all --flash	Failed to erase all sectors of Flash.
0x31	-e --all --spim	Failed to erase all sectors of SPIM.
0x32	-e --all --bootm	Failed to erase all sectors of boot memory.
0x33	-e --sec	Failed to erase selected sectors.
0x34	-eble --all	Failed to erase all sectors of BLE module Flash.
0x35	-eble –all --main	Failed to erase all sectors of BLE main code space.
0x36	-eble --all --nvr	Failed to erase all sectors of BLE NVR space.
0x37	-eble --all --rdn	Failed to erase all sectors of BLE RDN space.
0x38	-eble --sec	Failed to erase selected sectors of BLE main code space.
0x40	-otp	Failed to download One-Time Programmable data.

3.4 Flow chart

Figure 5 Flow chart



3.5 Write serial number

Use the “-wsn” command to write the serial number.

To write the serial number, users need to modify three parameters in the *WriteSN.ini* file, including:

- WriteAddr

Serial number write address

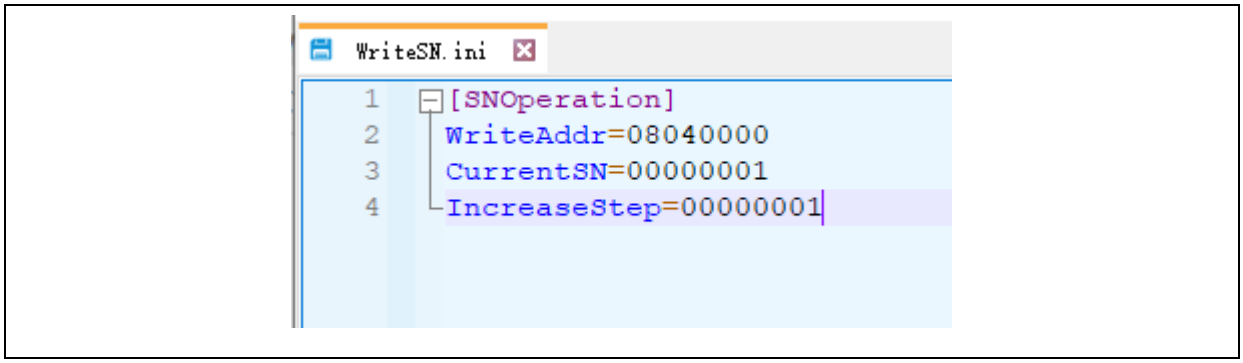
- CurrentSN

Current serial number. Every time the serial number is written successfully, this value will be automatically modified and incremented according to the step.

- IncreaseStep

Serial number increment step.

Figure 6 Serial number write configuration file



4 Revision history

Table 3 Document revision history

Date	Version	Revision note
2025/10/20	V2.12	1. Added support for specifying an AT-Link serial number during new connection.
2025/09/29	V2.11	1. Added Automatically generating QSPI encryption keys based on UID.
2025/02/18	V2.10	1. Added serial number write feature.
2024/10/29	V2.09	1. Support for AT32M412/M416 series. 2. Added downloading One-Time Programmable data.
2023/08/10	V2.08	1. Support for AT32F423VCW. 2. Support for AT32F402/F405 series.
2023/07/06	V2.07	1. Support for AT32A403A series.
2023/02/12	V2.06	1. Supports multiple platforms, including Windows, Linux (Ubuntu, Fedora) OS. 2. Added AT32F423 series.
2022/08/12	V2.05	1. Added return codes.
2022/07/15	V2.04	1. Added AT32L021 series.
2022/04/27	V2.03	1. Support reset and run.
2022/01/26	V2.02	1. Added AT32WB415CCU7-7
2022/01/04	V2.01	1. Added SPIM support. 2. Support disable/enable of the advanced access protection. 3. Support disable/enable of the programming protection. 4. Support upload feature. 5. Support direct read/write feature.
2021/11/26	V2.00	1. Initial release. Support AT32F403/F413/F415/F421/F403A/F407/F435/F437. 2. Added AT32F425 series.

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