Flash Programming Tool

User Guide

SUMMARY: This document describes the functionality and instructions on how to use the Atmosic Flash Programming Tool.

Atmosic™

Doc. No. ATM-UGFPT-0054

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Acronyms and Abbreviations

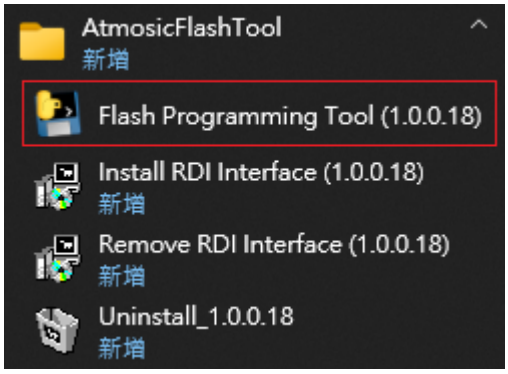
Acronyms	Definition
BD	Bluetooth Device
EVK	Evaluation Kit
NA	Not available
NVDS	Non-volatile Device Storage
RDI	Remote Debug Interface
SWD	Serial Wire Debug
SWDIF	Serial Wire Debug Interface

1. Overview

The Atmosic Flash Programming Tool supports different interfaces (such as FTDI/RDI/J-Link) of various platforms using the same set of tools, without the need to switch between multiple toolsets. The tool integrates two programming methods, OpenOCD (when the Atmosic RDI driver is installed) and J-Link script (without the Atmosic RDI driver), and automatically determines which method to use based on the hardware and driver used.

2. Install Flash Programming Tool

Run the Flash Programming Tool executable, AtmosicFlashTool_Inst_202xxxxx_v1.0.0.x.exe. After installing, invoke the Flash Programming Tool from the Start Menu/AtmosicFlashTool.



Note: *This Flash Programming Tool is supported only in Windows.*

3. Features

The Flash Programming Tool can be divided into the following features:

- SWD Interface
- SWD Interface Information
- ATM File
- Clear Log
- Program
- Dump
- Erase
- Log Information
- Export Log

- Setup Environment
- Configuration File

3.1 SWD Interface

The Flash Programming Tool detects connected devices and retrieves their device IDs to add to the list. Currently, the supported interfaces are RDI, FTDI, and J-LINK. Devices without installed drivers will not be included in the list.

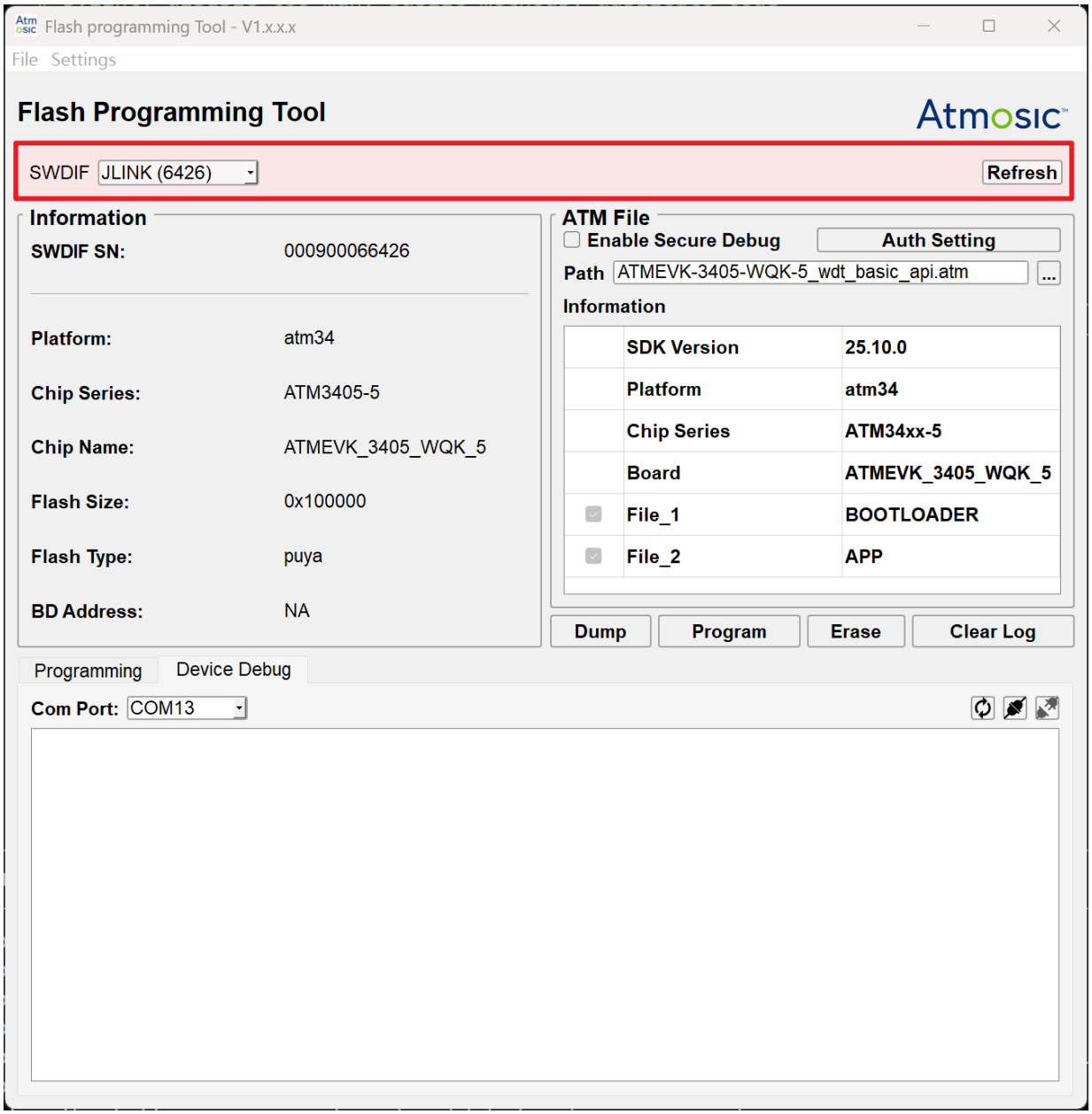


Figure 3-1 SWD Interface in Main GUI

- **SWDIF Combobox**

  List all the device IDs supported (including the device name, such as FTDI/RDI/JLINK) for which drivers must be installed first.

- **Refresh**

  Click this button to refresh the device list.

3.2 SWD Interface Information

When the tool is activated, it will read relevant Device information based on the detected devices. If multiple devices are connected at the same time, the tool will wait until all information is acquired before allowing the user to proceed. Fields with unavailable information will be displayed as 'NA'.

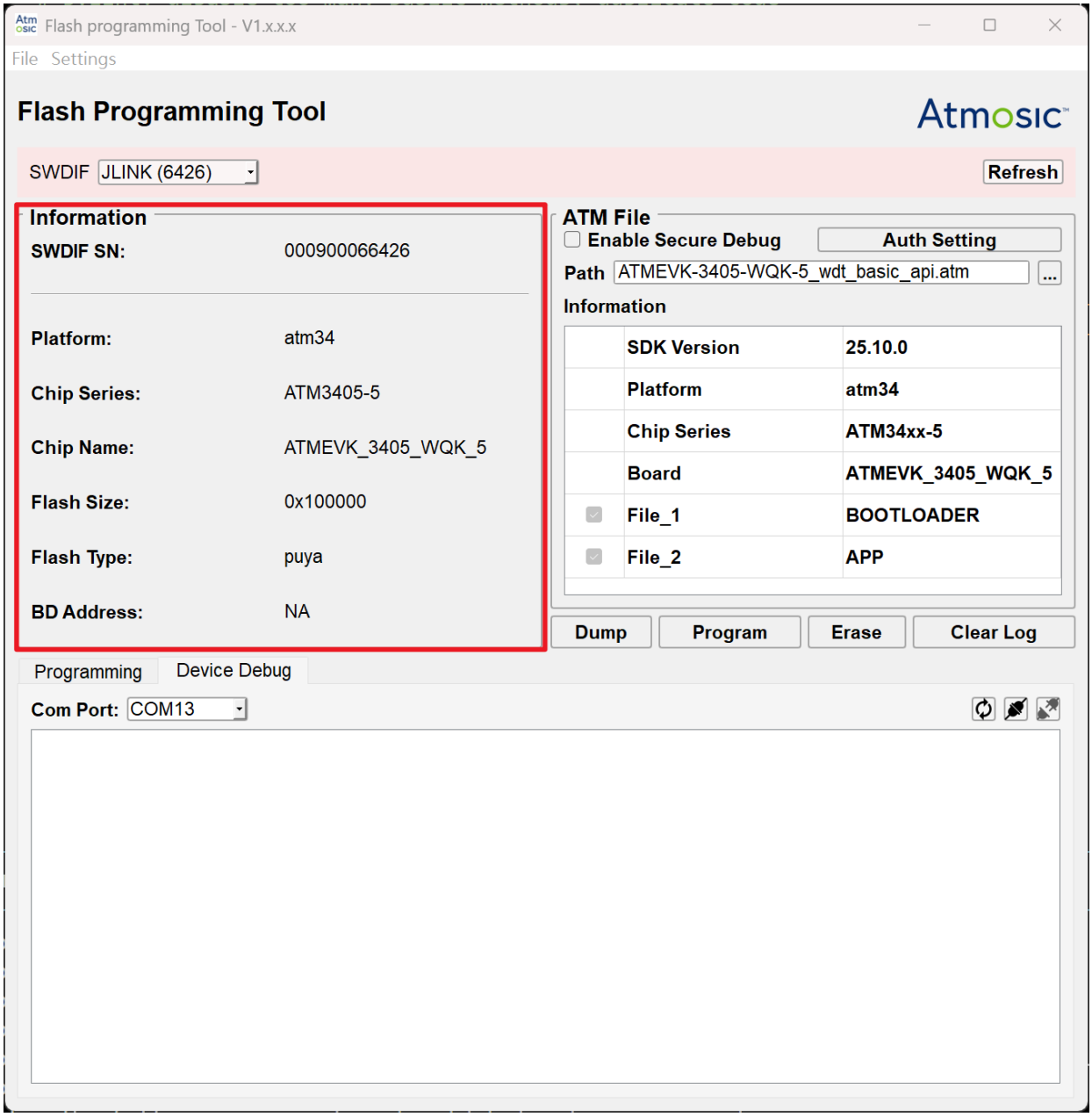


Figure 3-2 SWDIF Information in Main GUI

- **SWDIF SN**

  The full device ID of the device.

- **Platform**

  The platform information for the device

- **Chip Series**

  The chip series information for the device.

- **Chip Name**

  The chip name information for the device (Only ATM34/e displays this Information).

- **Flash Size**

  The flash size for the device (This message will be displayed if the device has previously written flash data).

- **Flash Type**

  The flash type for the device (This message will be displayed if the device has previously written flash data).

- **BD Address (This value is only available when the EVK is flashed with Bare Metal firmware)**

  The BD address for the device.

  Note: *The BD address will be read based on the following rules:*

  - *There is chip series information, but the ATM file has not been selected yet. ⇒* ***Use the default NVDS address to get information***
  - *There is chip series information, and the ATM file has been selected as well. ⇒* ***Use the NVDS address from within the ATM file to get information***
  - *There is no chip series information, and the ATM file has not been selected. ⇒* ***Once the ATM file is selected, the information will be retrieved using the NVDS address from within the ATM file.***
  - *If the BD address cannot be read, the default value will be* ***'NA'****.*

3.3 ATM File

The tool currently only supports flashing firmware in `*.atm` format. After the user selects the desired `*.atm` file for flashing, the tool will list the included partition information in the Information text area below.

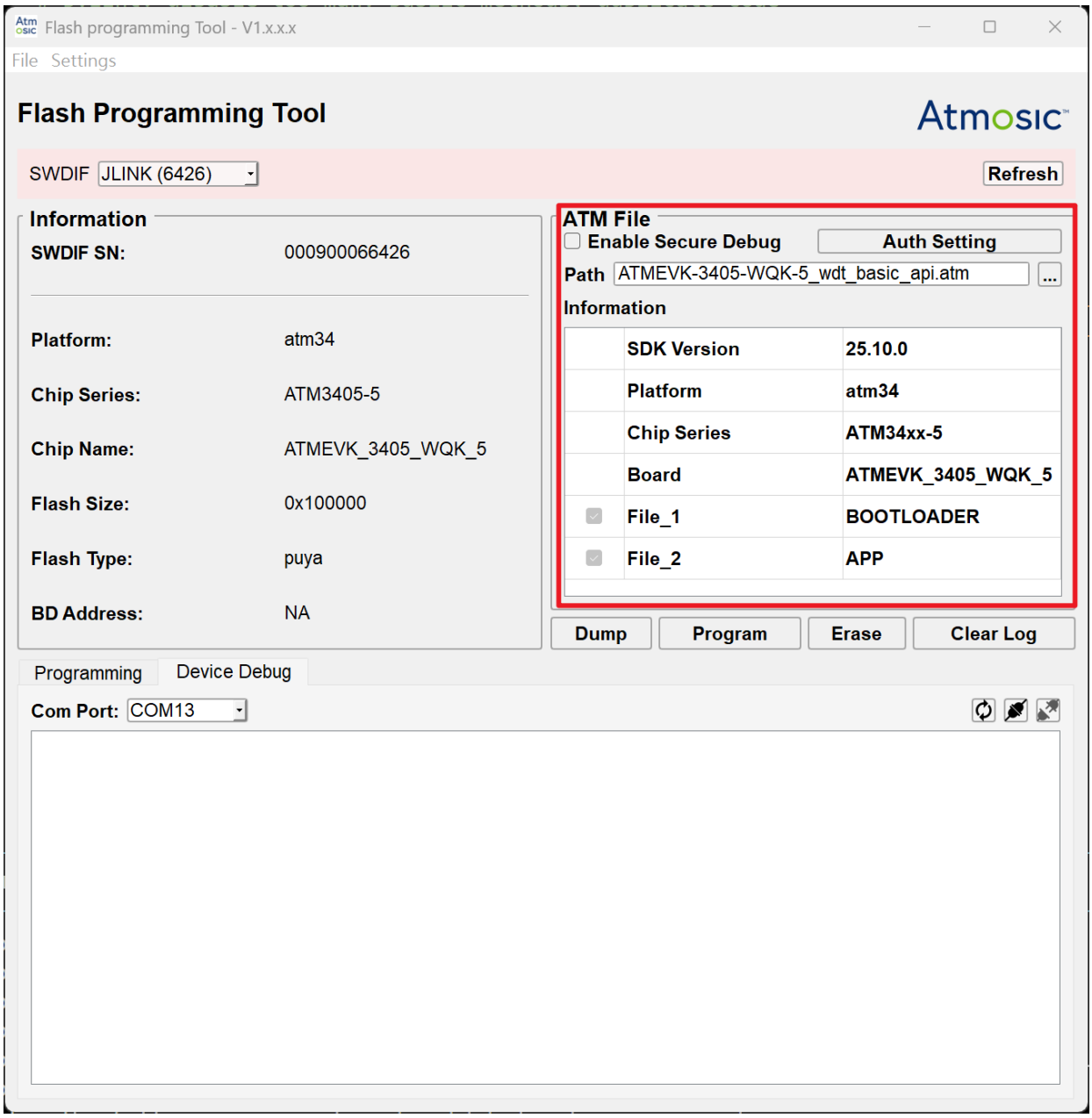


Figure 3-3 ATM File in Main GUI

- **Enable Secure Debug**

  When selected, the Authentication unlock process will be performed before flashing the EVK. Relevant parameter settings can be configured in the 'Auth Setting' feature (feature only supported with ATM33/e and ATM34/e series SoCs).

- **Auth Setting**

  Used to configure the Secure Debug Key location path and authentication port.

- **ATM Path**

  Users can select an ATM file here.

- **ATM Information**

  After the user selects the atm file, the relevant information of the atm file will be displayed here.

  - The BD Address will be pre-selected as unchecked when the device already has a BD Address. However, if the device does not have a BD Address previously, it will require the user to program it forcibly.
  - The BD Address format is xx:xx:xx:xx:xx:xx. If the format is incorrect, writing will not be possible.
  - The ATM file compiled by the Zephyr SDK does not support the function to modify the BD Address.

3.4 Clear Log

Simultaneously, `Clear Log` data for both Programming and Device Debug.

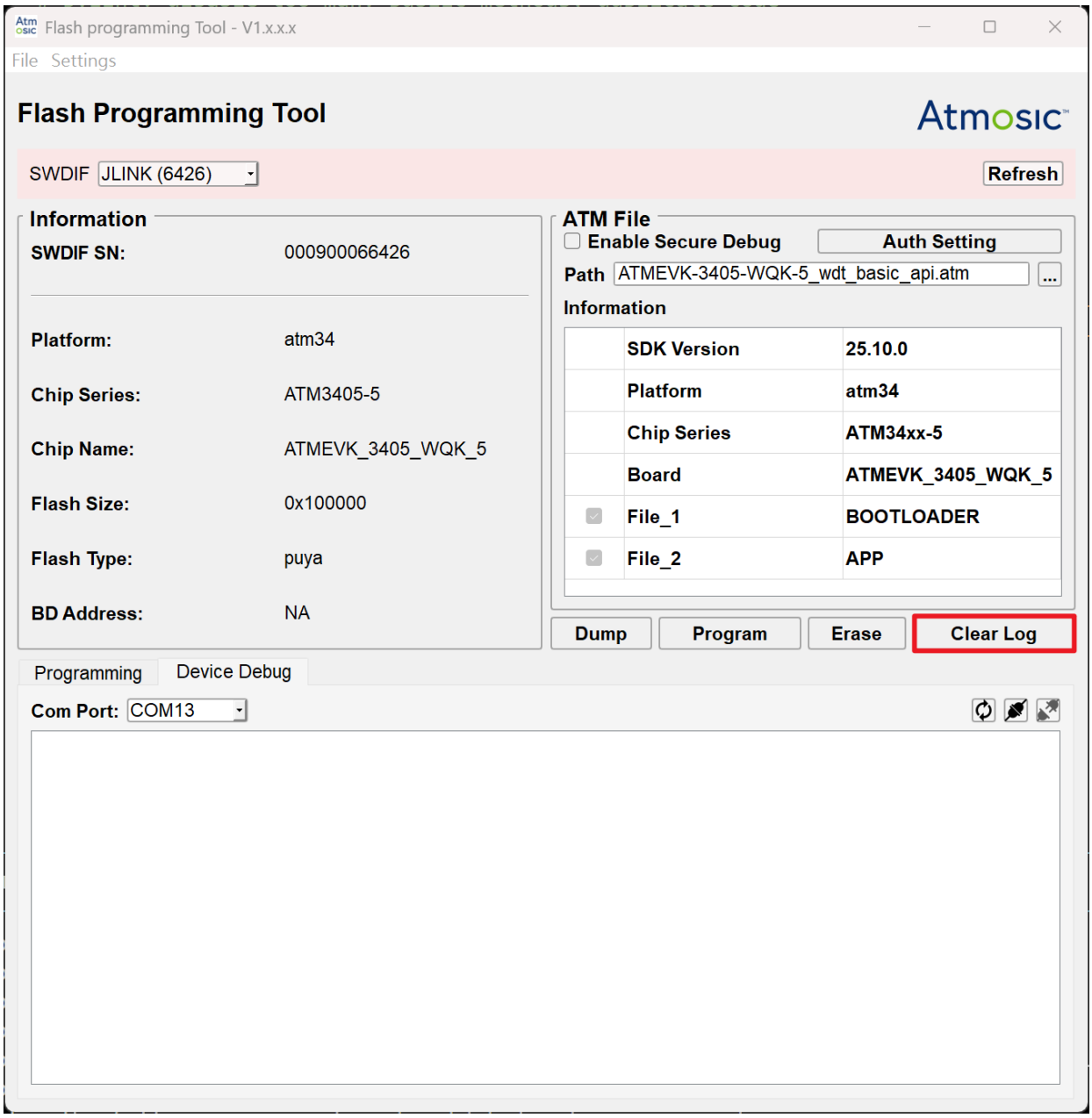


Figure 3-4 Clear Log in Main GUI

3.5 Program

Write the `*.atm` file to flash. By checking/unchecking the checkboxes in the information text area, you can modify the partitions to be programmed into the flash memory.

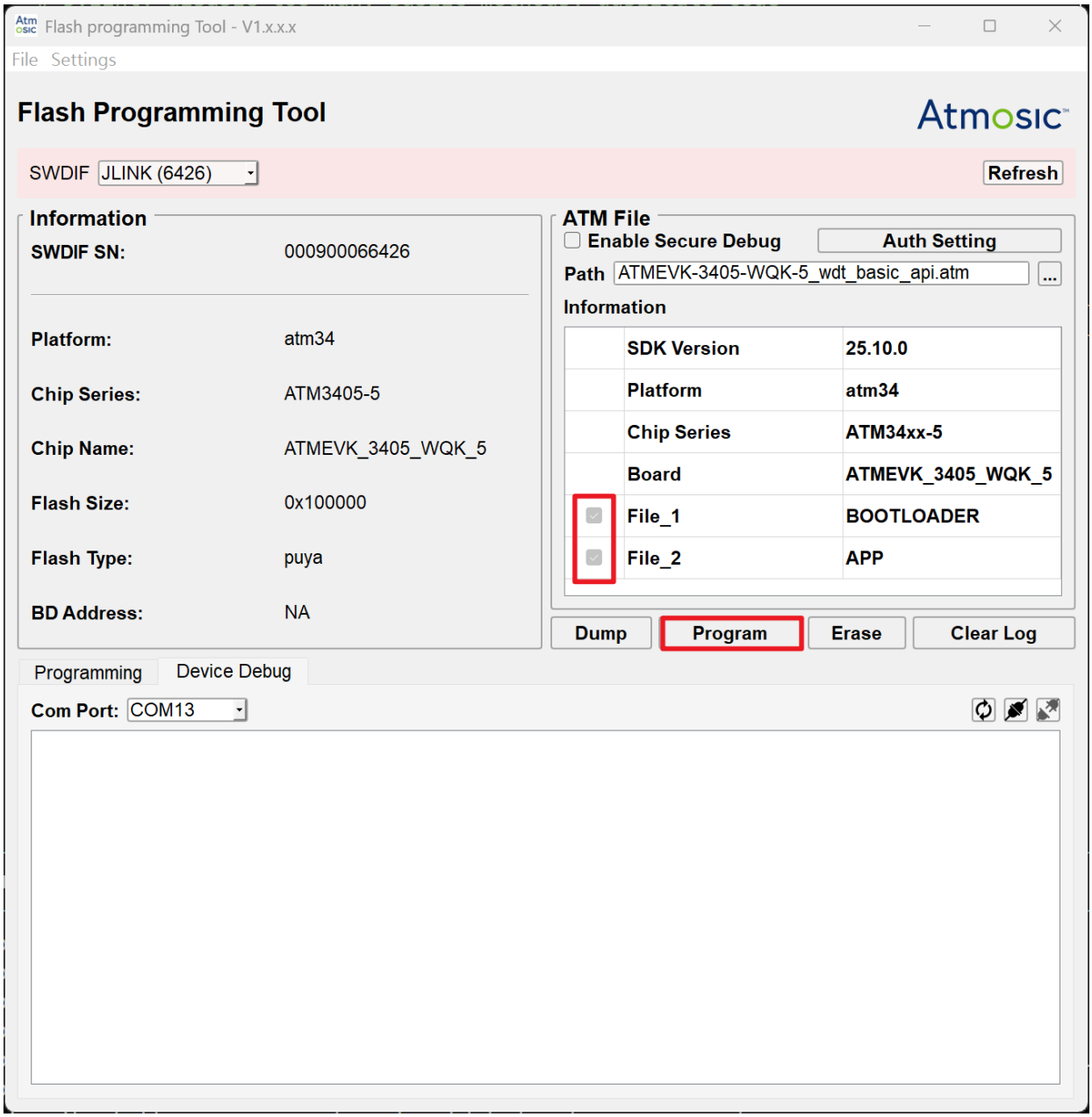


Figure 3-5 Program in Main GUI

3.6 Dump

Read the device data from flash and save it as a `.bin` file.

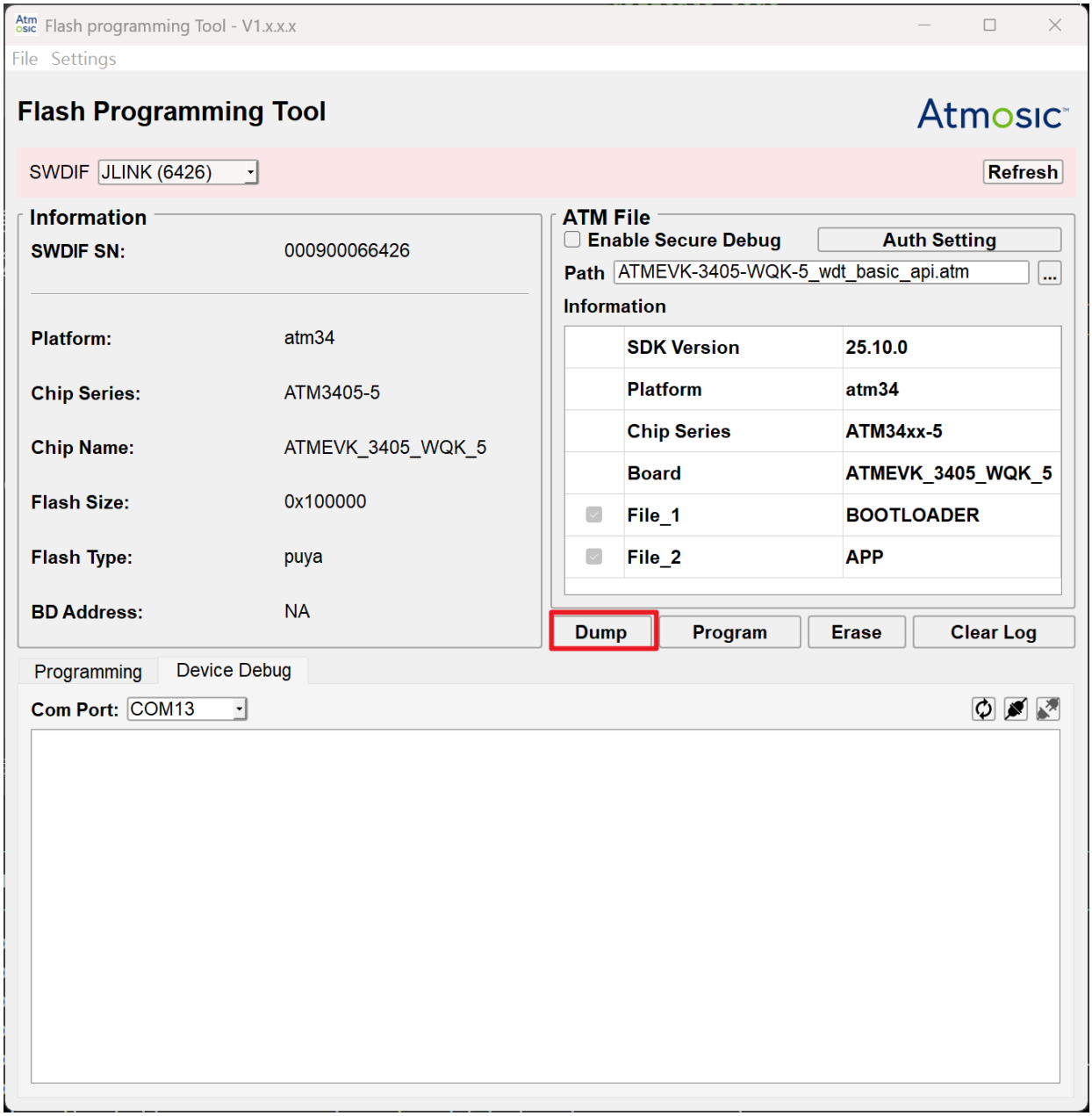


Figure 3-6 Dump in Main GUI

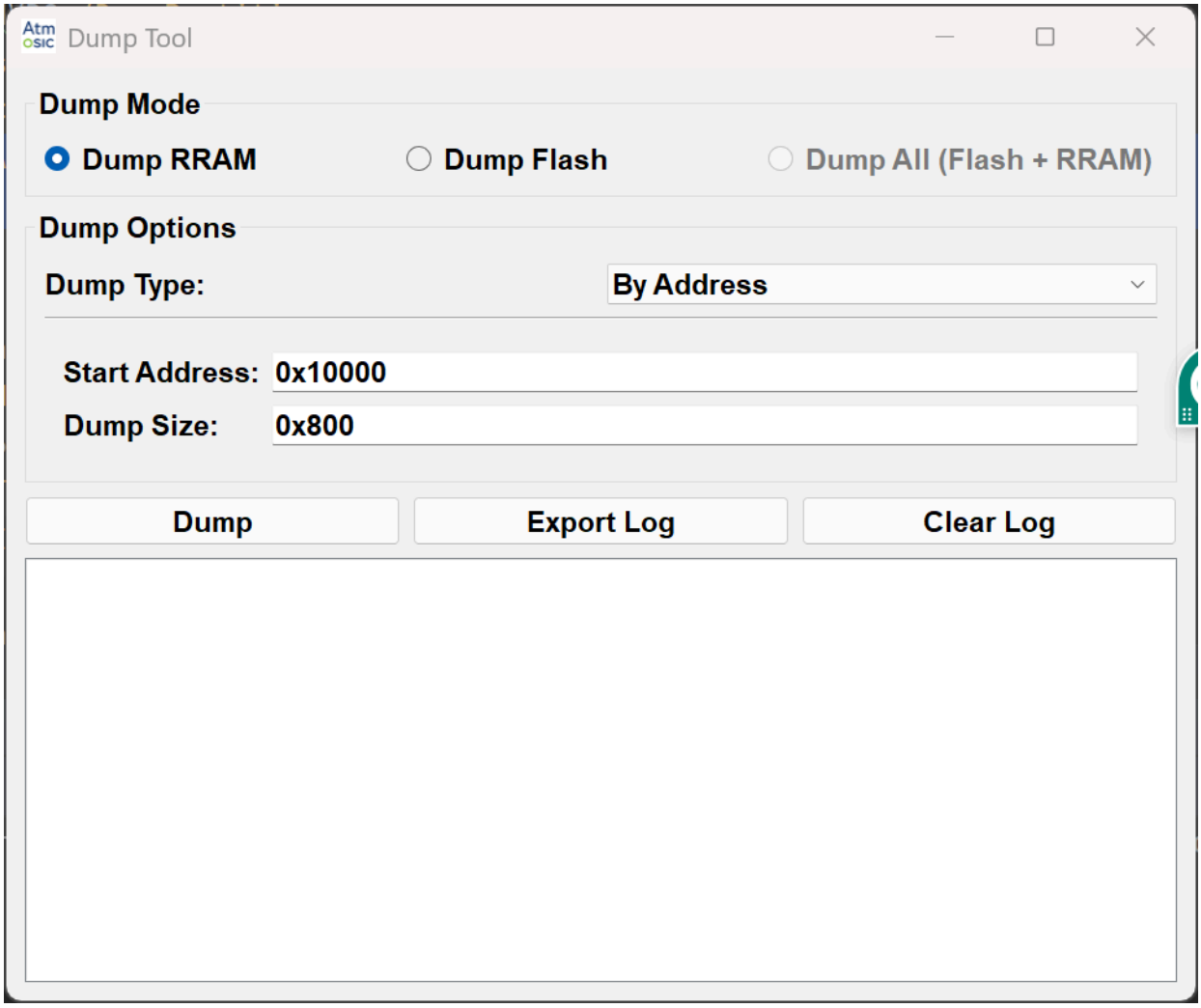


Figure 3-7 Dump Tool Dialog

3.7 Erase

Perform an erase operation on the specified address.

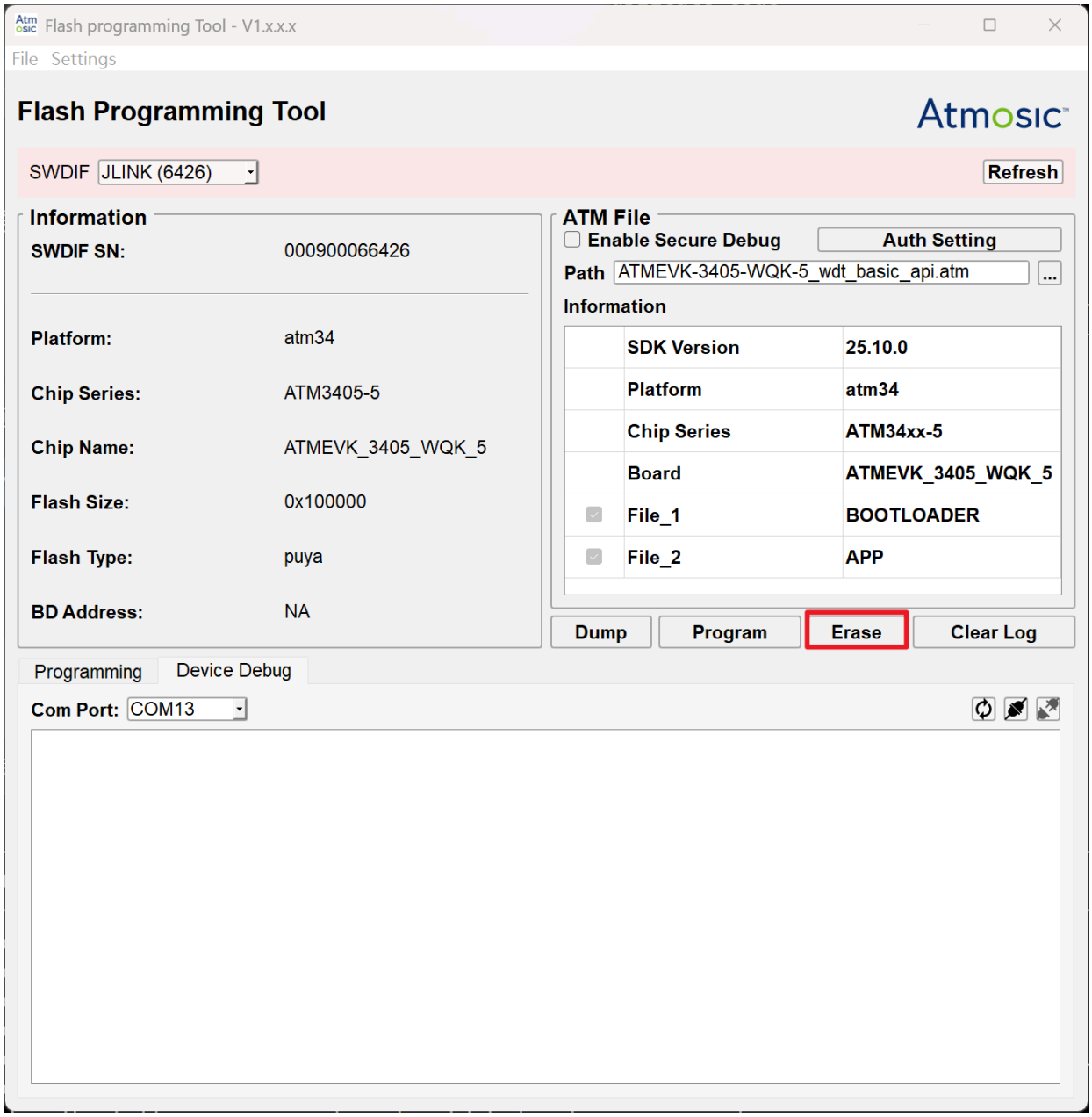


Figure 3-8 Erase in Main GUI

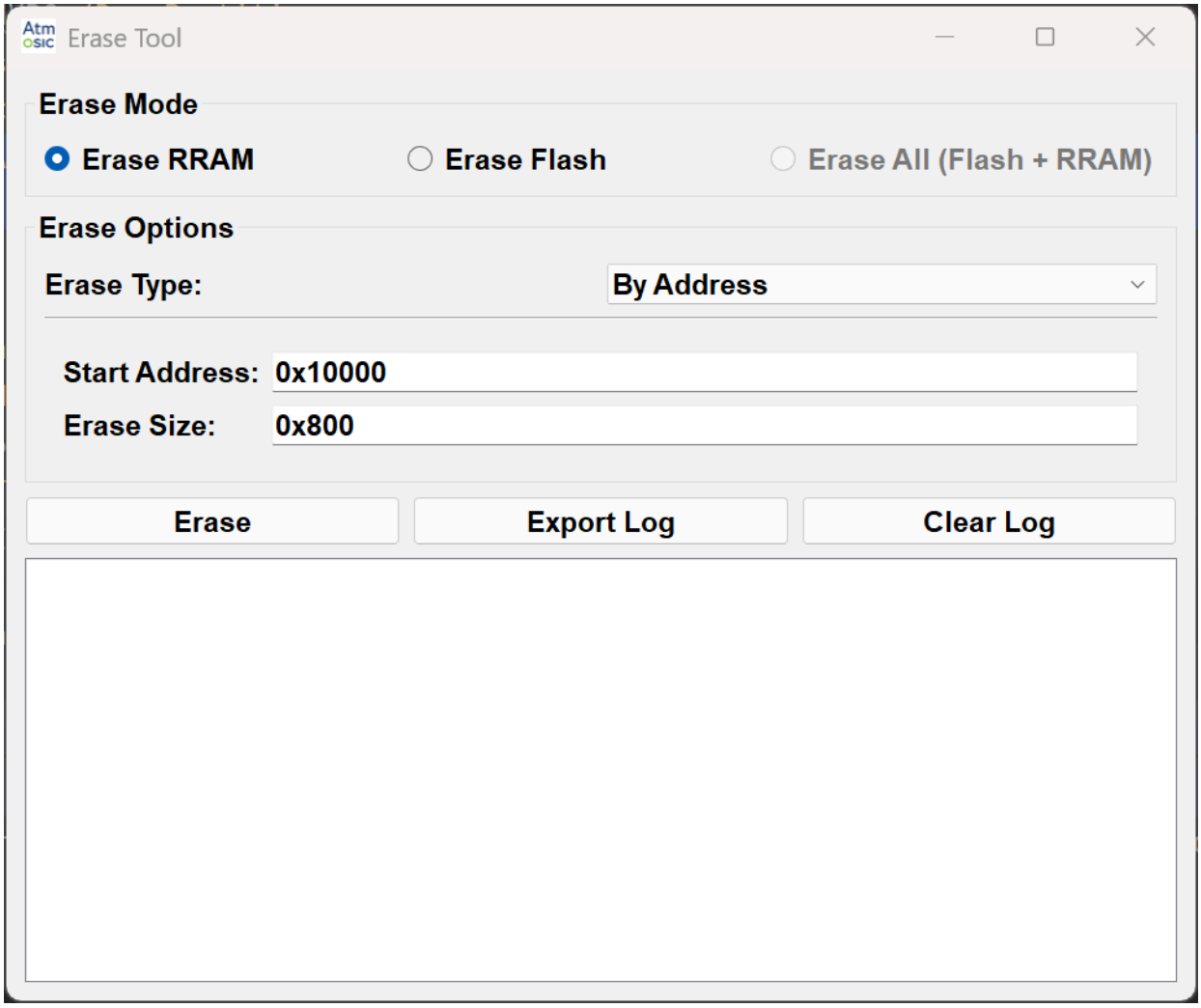


Figure 3-9 Erase Tool Dialog

3.8 Log Information

The tool provides two types of log content for users to analyze. Users can switch tabs to view different log content.

3.8.1 Programming Log

Displaying the tool log and the execution results obtained after running commands.

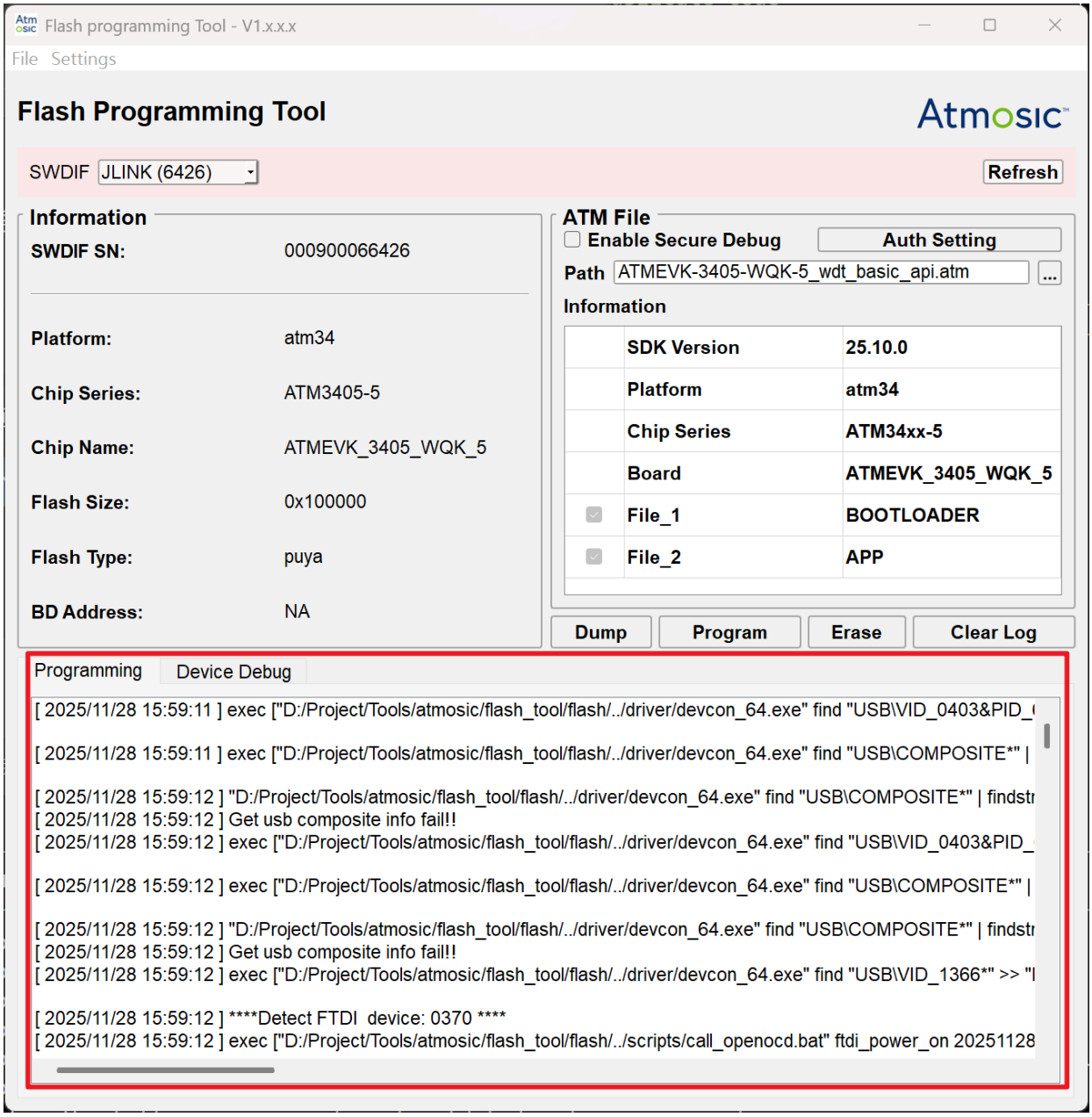


Figure 3-10 Programming Log in Main GUI

3.8.2 Device Debug Log

Boot-up logs are shown after connecting to EVK via the UART COM Port.

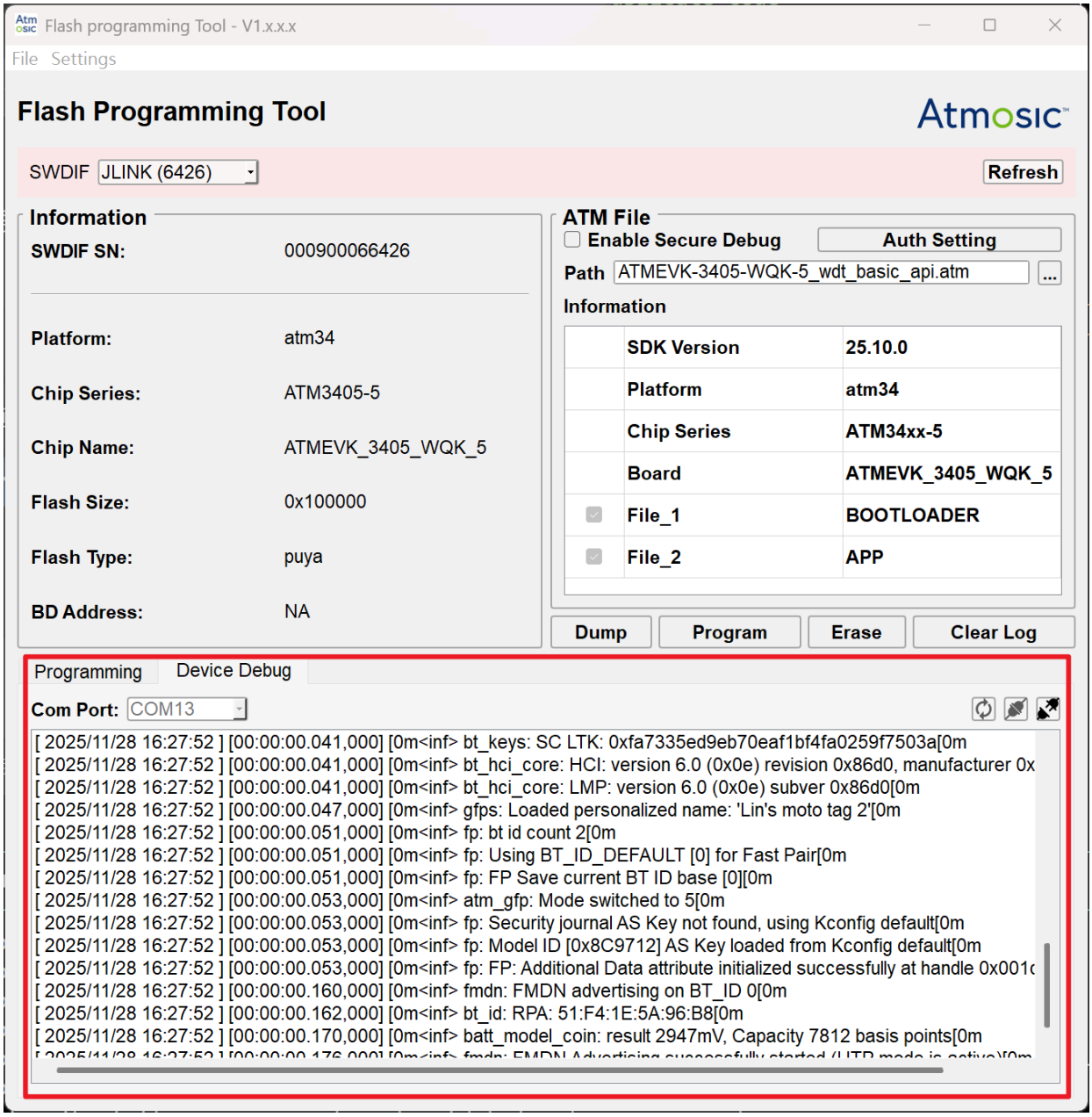


Figure 3-11 Device Debug Log in Main GUI

- **Com Port**

  The UART COM port to connect to.

- **Connect**

  Connect to the specified UART COM port.

- **Disconnect**

Disconnect the UART COM port.

- **Refresh**

  Update the UART COM port list.

3.9 Export Log

Store the Programming Log and Device Debug Log in the specified paths, respectively.

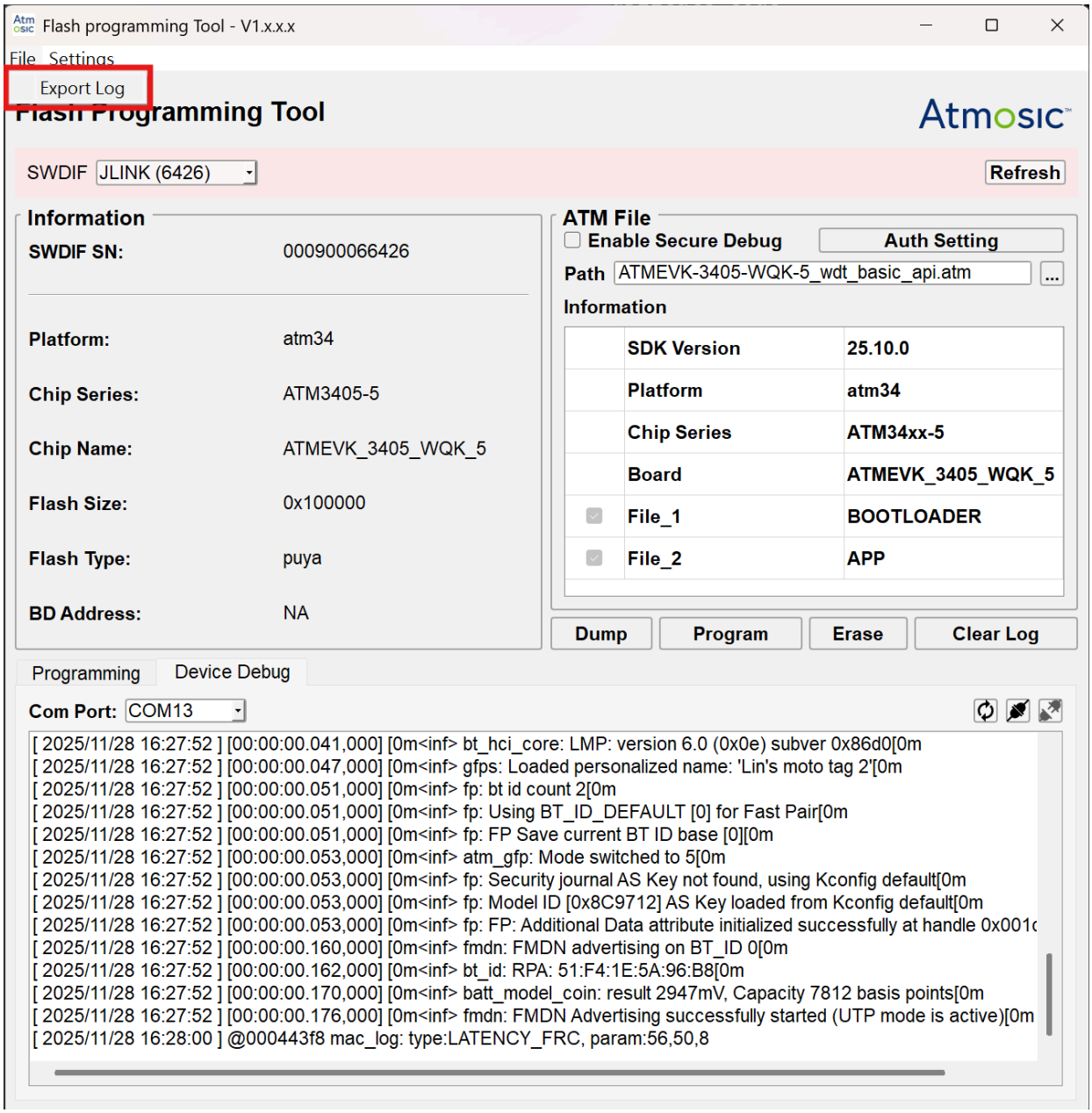


Figure 3-12 Export Log in Main GUI

3.10 Setup Environment

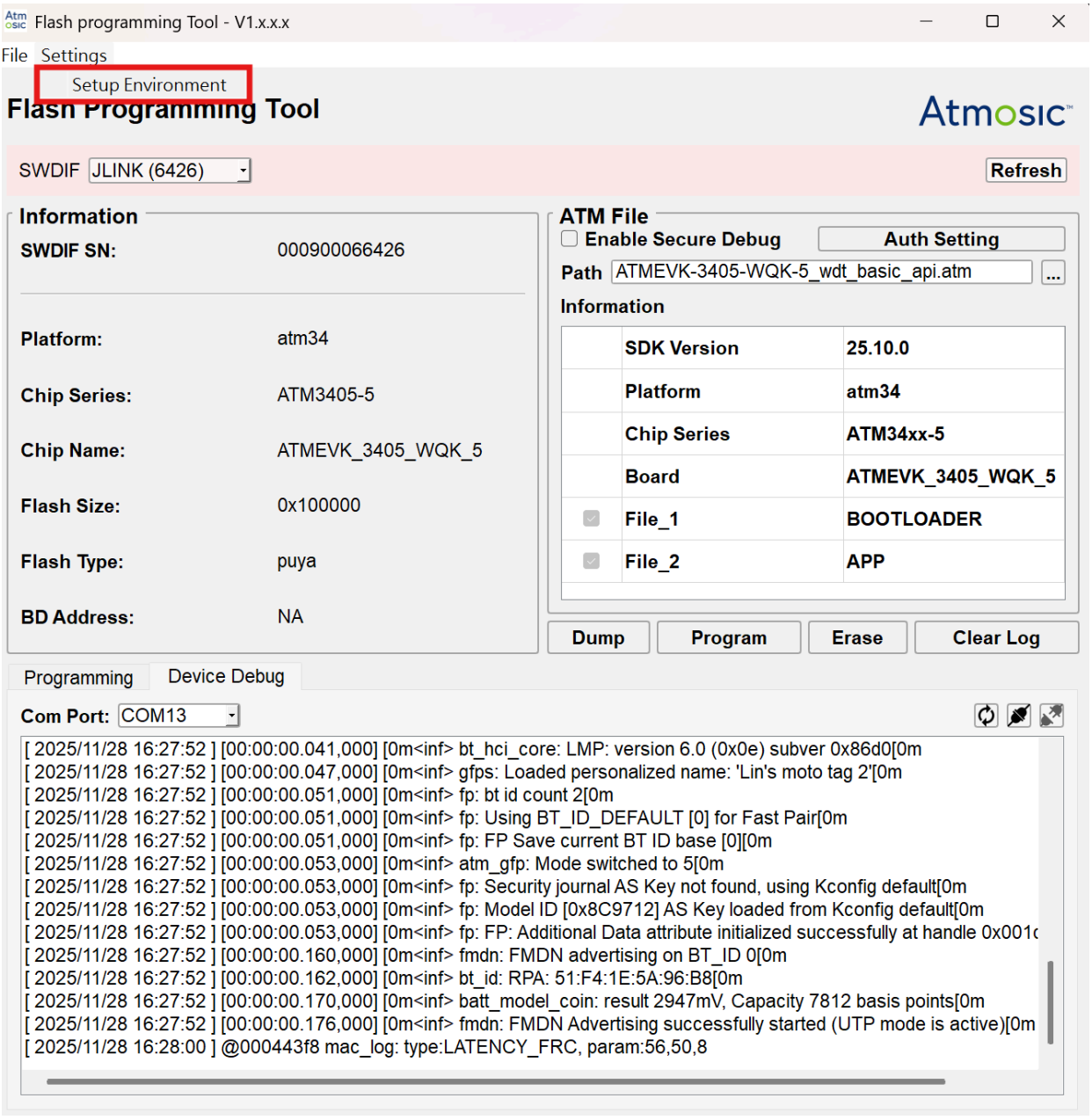


Figure 3-13 Setup Environment in Main GUI

To add a J-Link device and flash loader, you can add them either automatically or manually by following the steps below:

- J-Link Version V7.88m (2023-07-19):

  For Windows:

a) Create Atmosic folder under C:\Users\<USER>\AppData\Roaming\SEGGER\JLinkDevices

b) Create ATMx2/ATM33/ATM34 folder under C:\Users\<USER>\AppData\Roaming\SEGGER\JLinkDevices\Atmosic

c) Copy ATMx2.xml and ATMx2.FLM from <flash tool path>\jlink\flash_loader into the above new created ATMx2 folder

d) Copy the following files from <flash tool path>\jlink\flash_loader into the above newly created ATM33 folder

- ATM33.xml
- ATM33_RRAM.FLM
- ATM3330_EXTFLASH.FLM
- ATM3325_EXTFLASH.FLM
- ATM3325_STACKFLASH.FLM

e) Copy the following files from <flash tool path>\jlink\flash_loader into the above newly created ATM34 folder

- ATM34.xml
- ATM34_RRAM.FLM
- ATM34-5_RRAM.FLM
- ATM3405_EXTFLASH.FLM
- ATM3425_EXTFLASH.FLM
- ATM3430_EXTFLASH.FLM

Note:
- <USER> means the account name you use when logging into the computer.
- ATM53 hardware does not support J-Link, so no corresponding FLM file is required.

3.11 Configuration File

An external configuration file is provided for users to customize internal tool settings and save frequently used configurations. The file is located at C:\AtmosicFlashTool\{OS_type}\setting.xml. The adjustable settings are as follows:

- **Secure Debug Settings**
  - SecureDebugAuthPort: Records the Secure Debug Port information
  - EVKSecureDebugKeyFilePath: Records the file path of the Secure Debug Key (for EVK use)
  - ATMSecureDebugKeyFilePath: Records the file path of the Secure Debug Key (for ATM use)
- **GUI Settings**
  - CurrentSWDIF: Records the selected SWD interface information
  - AtmFilePath: Records the selected ATM file path information
  - ToolVersion: Force the use of the specified tool version
- **Erase Settings(for Erase Tool)**
  - EraseType: Records the selected Erase Type information
  - EraseMode: Records the selected Erase Mode information
  - ErasePartition: Records the selected Erase Partition information
  - EraseStartAddress: Records the Erase Start Address information
  - EraseSize: Records the Erase Size information
- **Dump Settings(for Dump Tool)**
  - DumpType: Records the selected Dump Type information
  - DumpMode: Records the selected Dump Mode information
  - DumpPartition: Records the selected Dump Partition information
  - DumpStartAddress: Records the Dump Start Address information
  - DumpSize: Records the Dump Size information
  - OffsetOutput: Records whether Offset Output is selected
- **Flash/RRAM Information**
  - RramAddr: Records the RRAM start address
  - RramSize: Records the RRAM size
  - StackFlashAddr: Records the Stack Flash start address
  - ExtFlashAddr: Records the External Flash start address
  - FlashSize: Records the Flash size
- **OpenOCD Settings**
  - SWD_WAKEUP: Sets whether the SWD_WAKEUP parameter is enabled(Default is ‘False’)
  - BBOOT_HEIGHT: Sets whether the BBOOT_HEIGHT parameter is enabled(Default is ‘True’)
  - FAST_DOWNLOAD: Sets whether the FAST_DOWNLOAD parameter is enabled(Default is ‘True’)
  - NORMAL_BOOT: Sets whether the NORMAL_BOOT parameter is enabled(When NORMAL_BOOT is set to True, the device will automatically reboot after programming is complete; Default is ‘True’)

- CHIP_ERASE: Sets whether to erase the whole flash before programming; the default is True (for ATM53, it is recommended to set this to False to avoid clearing important data)
- SPEED: Sets the SWD speed, which affects programming, erase, and dump times (may vary depending on the platform)

- **J-Link Settings**
  - DEV_NAME: Sets the name of the Flash Loader to be used by J-Link (may vary depending on the platform)
  - SPEED: Set the J-Link speed, which affects programming, erase, and dump times (may vary depending on the platform)
  - NVDS_START: Set the default read location for NVDS start address(may vary depending on the platform)
  - NVDS_SIZE: Set the default read location for NVDS size(may vary depending on the platform)

4. How to Switch the Flash Programming Mode in the ATM Information

Due to the possibility that users may need to exclude the action of programming Flash NVDS(In Zephyr SDK, it is called FACTORY_DATA), the tool provides three programming modes for switching (users can switch between the three modes by clicking the checkbox before NVDS or FACTORY_DATA item).

1) **Program all image files in atm**

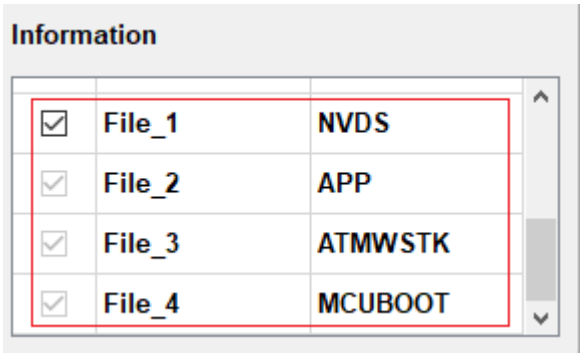


Figure 4-1 Program All Image Files in atm

2) **Program all image files except for NVDS or FACTORY_DATA**

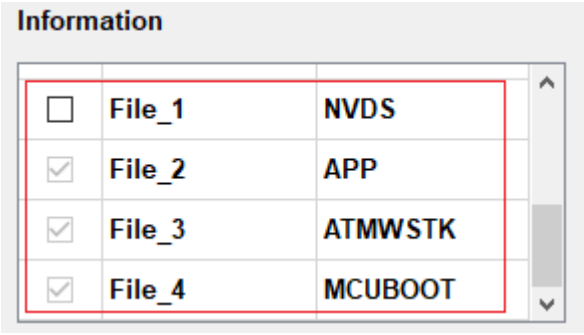


Figure 4-2 Program All Image Files Except for NVDS or FACTORY_DATA

3) **Program NVDS or FACTORY_DATA file only**

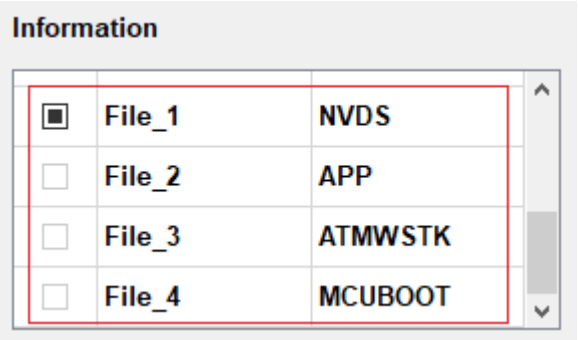


Figure 4-3 Program NVDS or FACTORY_DATA File Only

5. Write the ATM File to EVK

Step 1 - Select the `SWDIF` option.

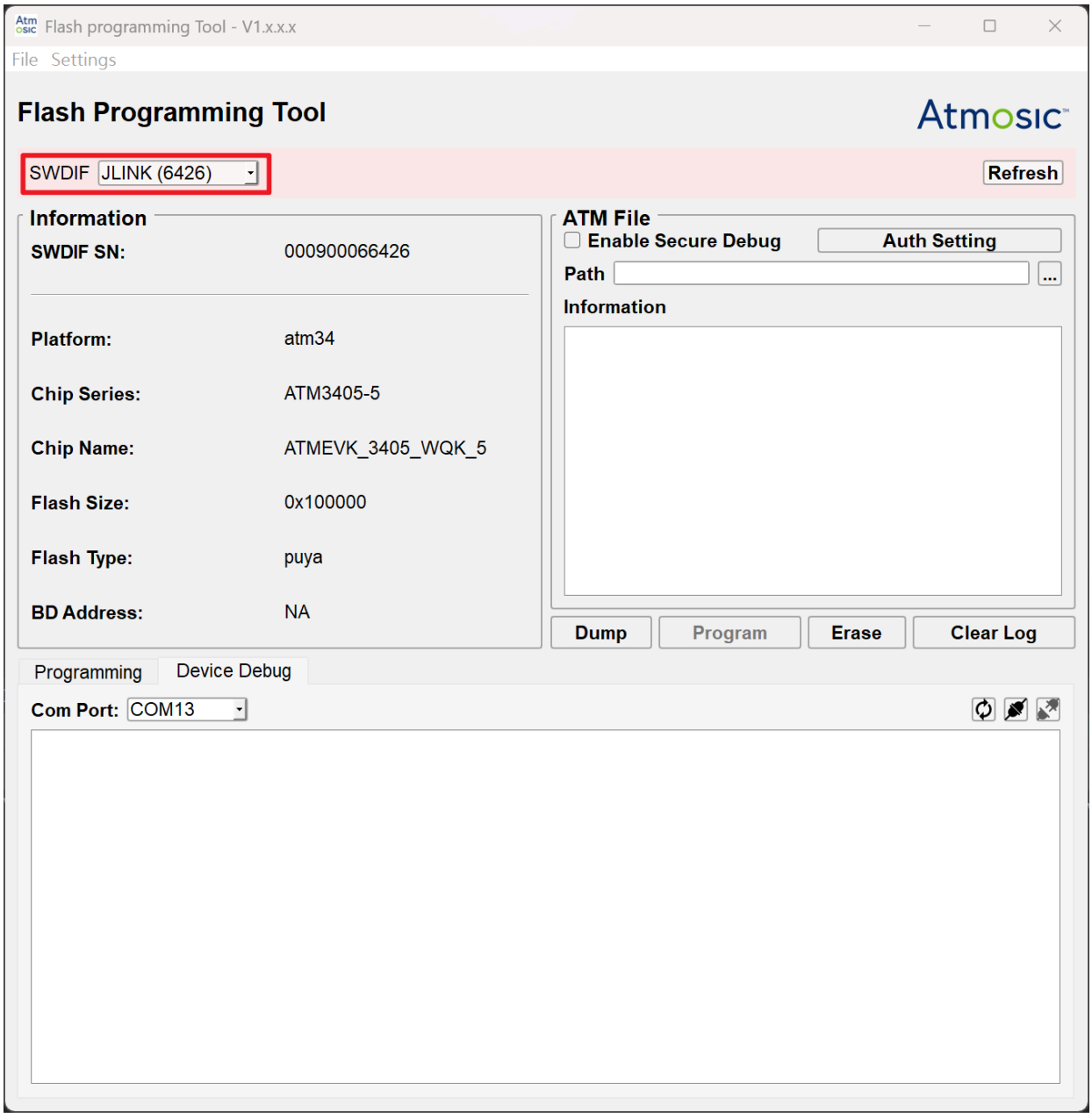


Figure 5-1 Select SWDIF Option

Step 2 - Click the `...` button to select the ATM image file.

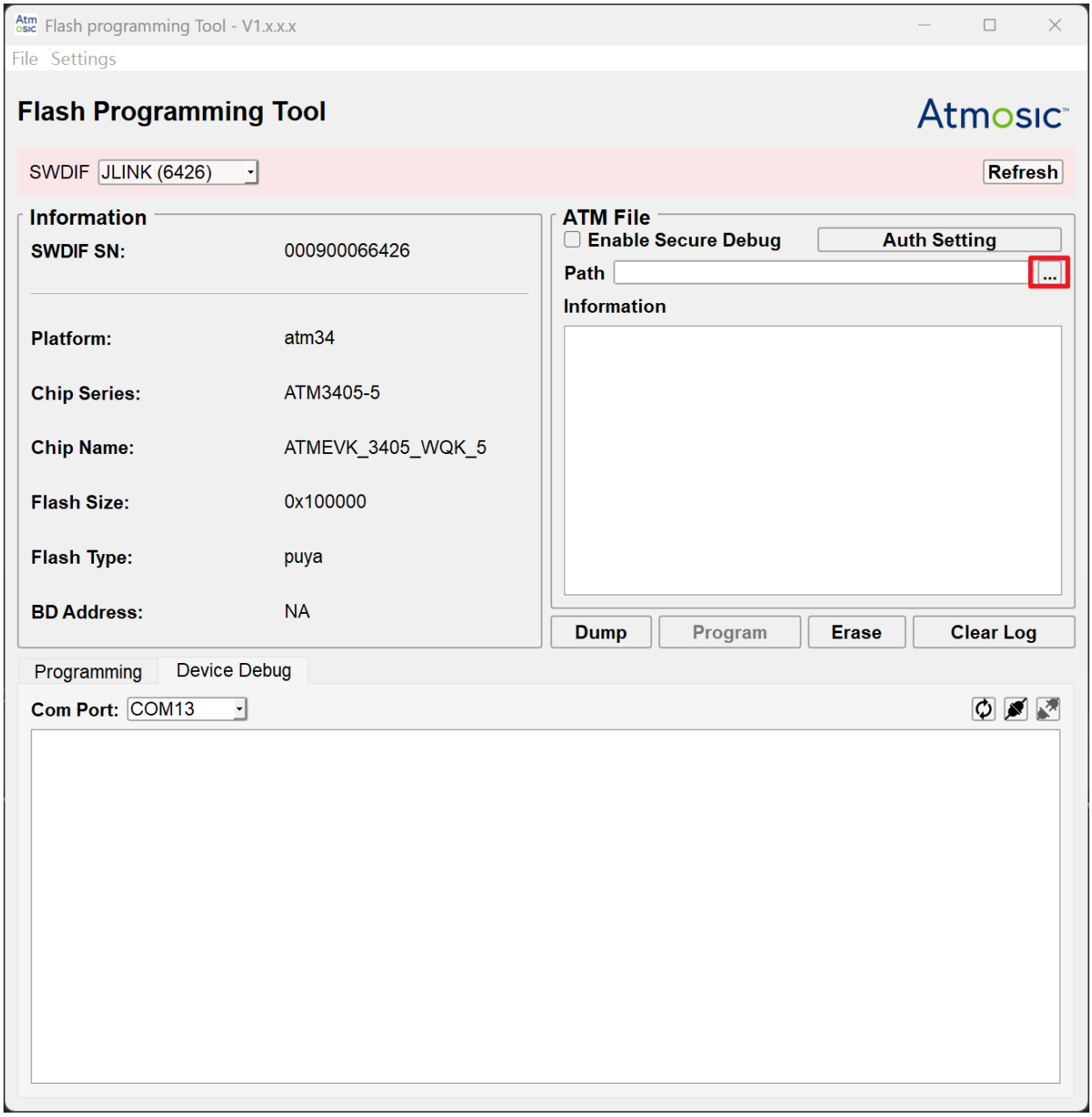


Figure 5-2 Select ATM Image File

Step 3 - If you want to modify the content of the partition to be flashed, you can change the checkbox of the FACTORY_DATA (In Bare Metal SDK, it is called NVDS) item.

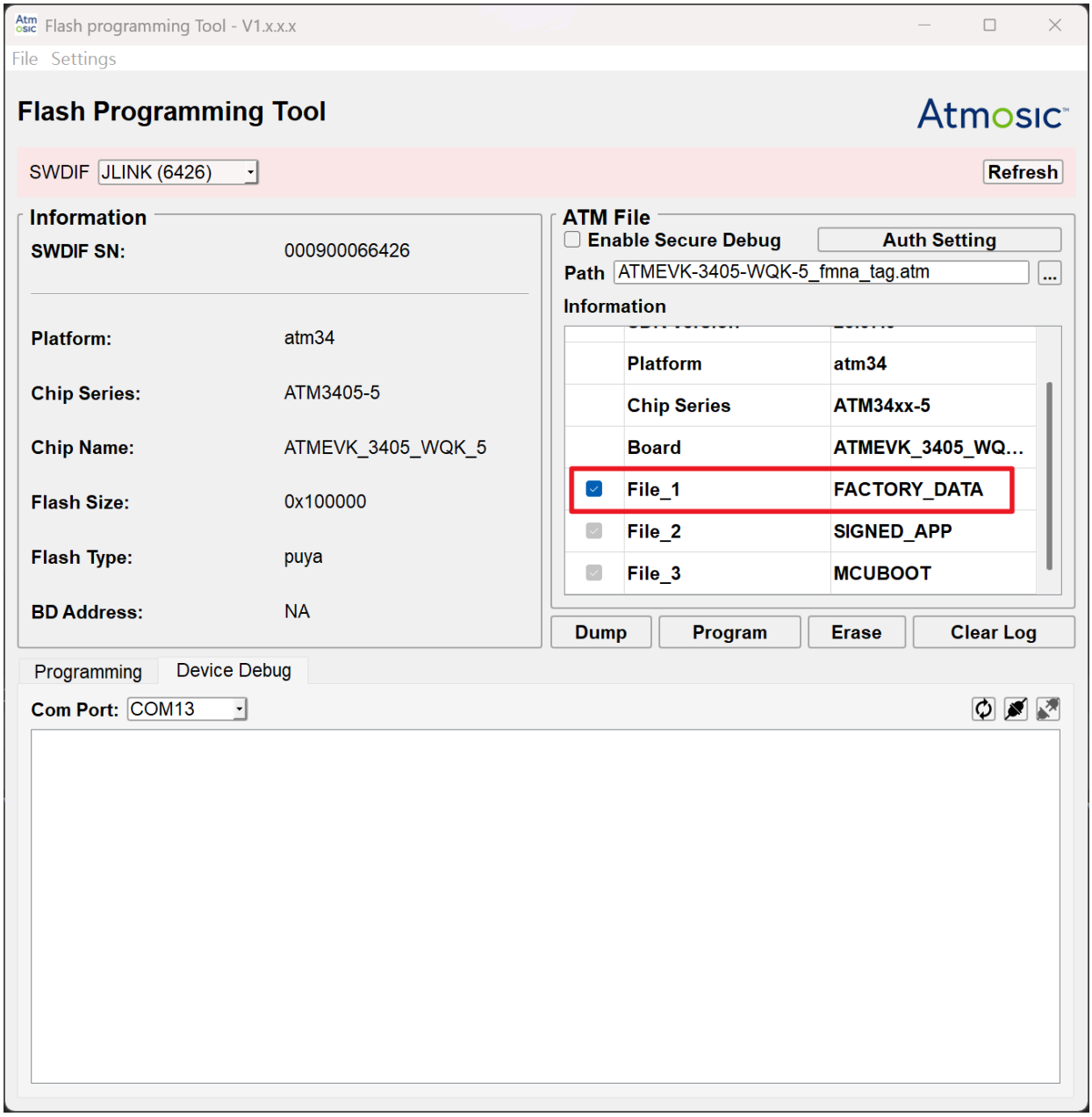


Figure 5-3 Change the Checkbox of the NVDS Item if Needed

Step 4 - Click the `Program` button to write image files to EVK. A pop-up screen will indicate successful recording when the write operation is successful.

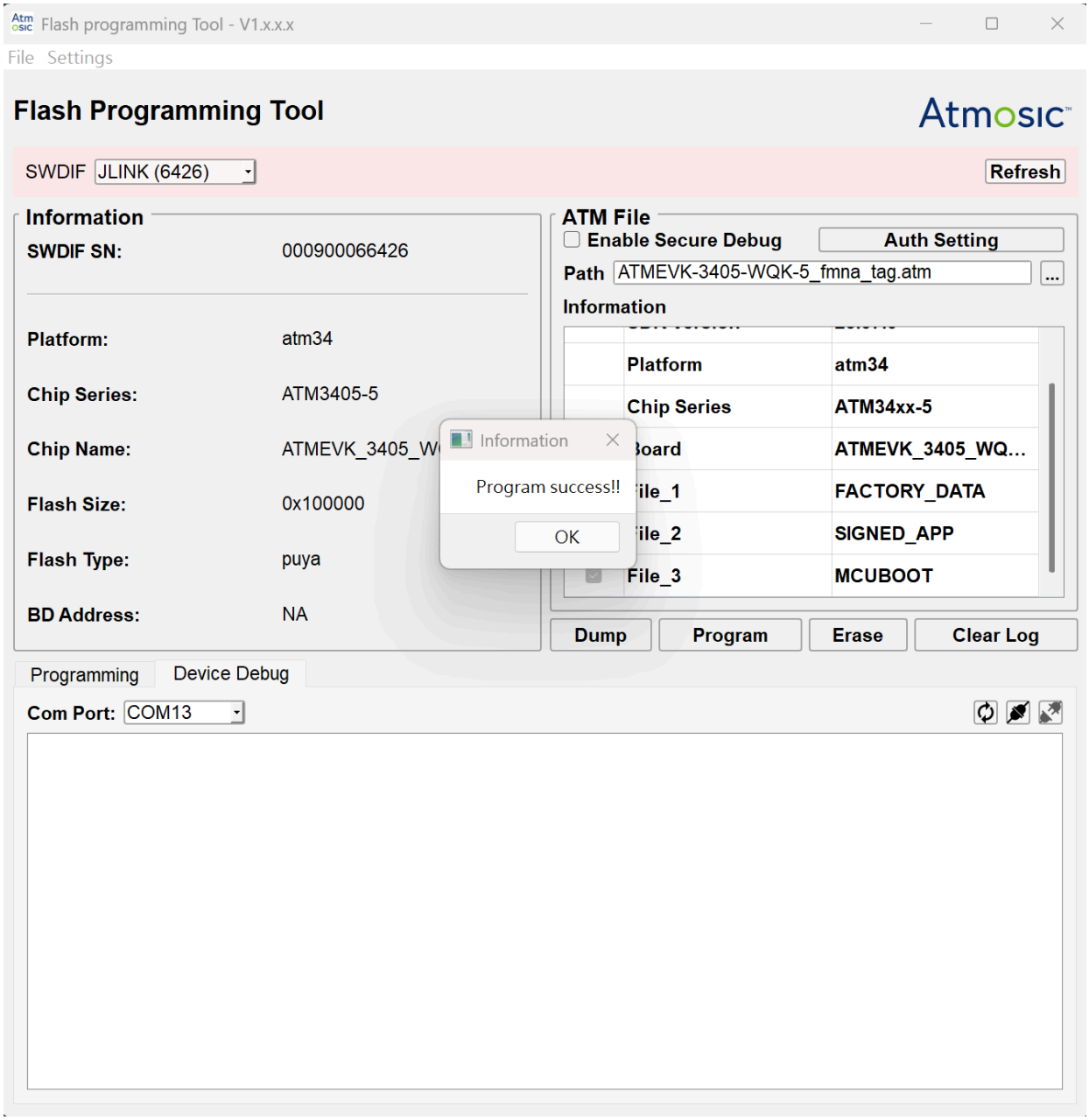


Figure 5-4 Write Flash Data Success Dialog

6. Write the ATM File to EVK with Secure Debug Enabled

Step 1 - Select the `SWDIF` option.

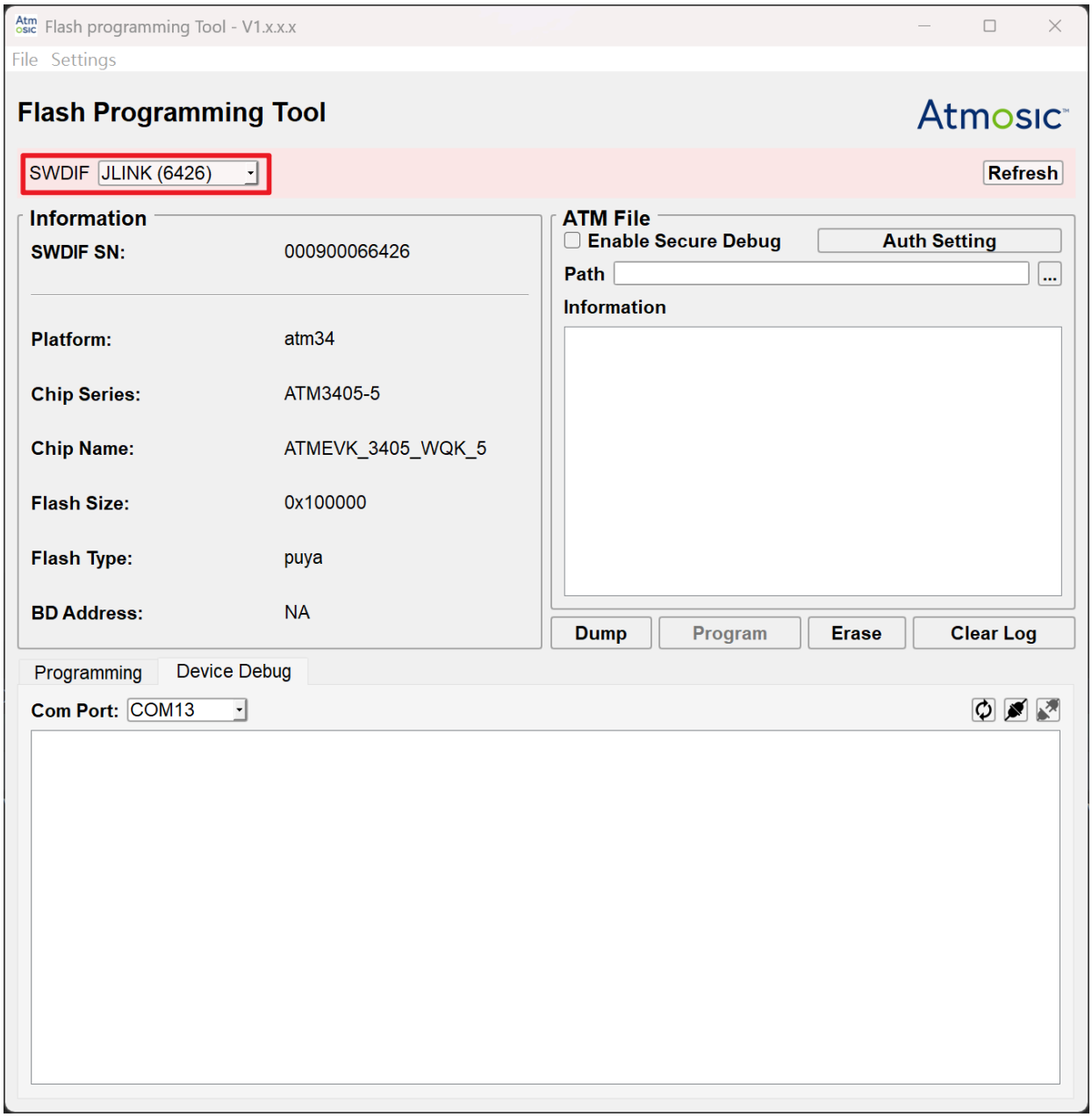


Figure 6-1 Select SWDIF Option

Step 2 - Click the `...` button to select the ATM image file.

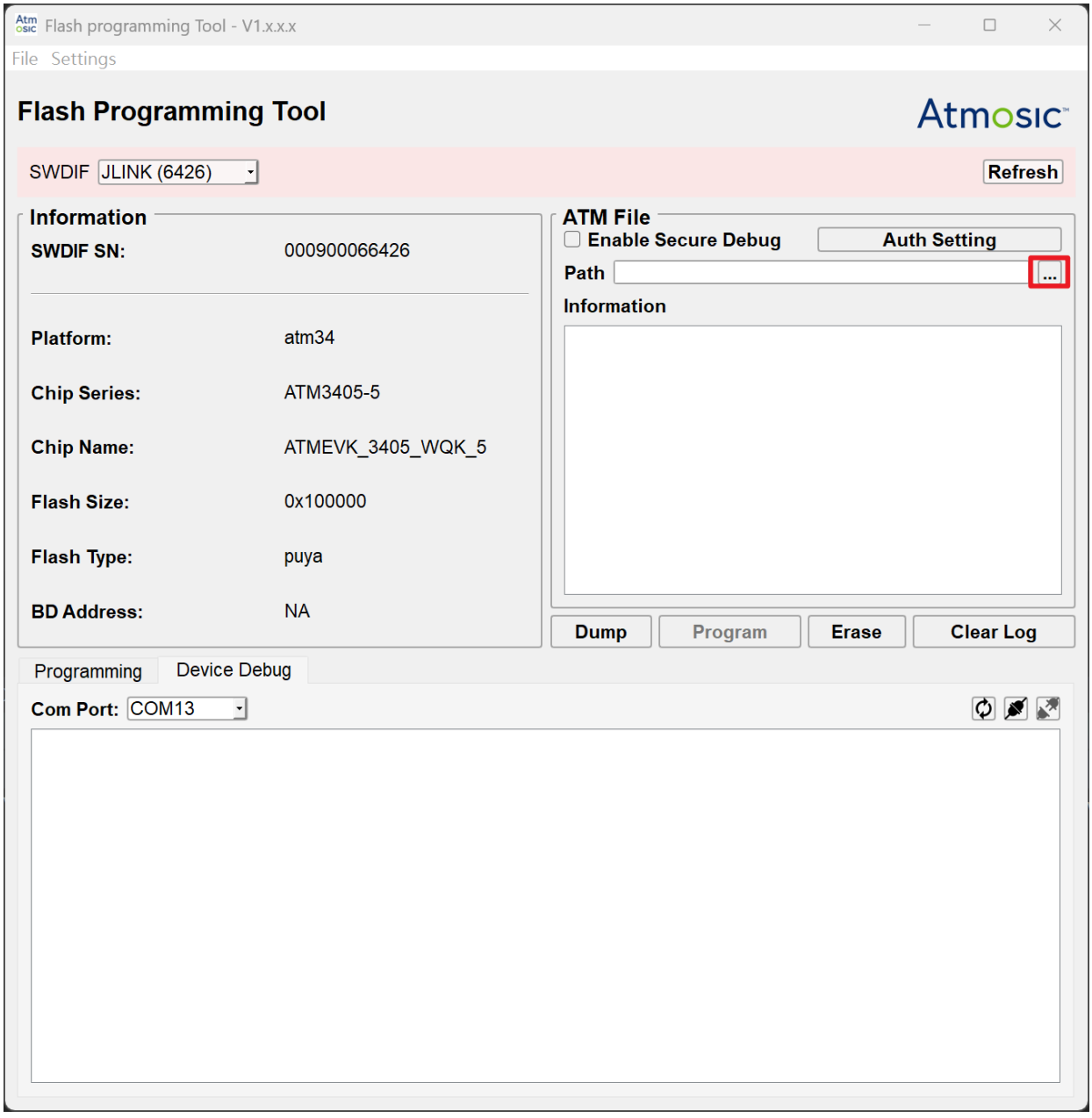


Figure 6-2 Select ATM Image File

Step 3 - Clicking the `Auth Setting` button, a window will pop up for the user to select the `Secure Debug Key` and `Auth Port`.

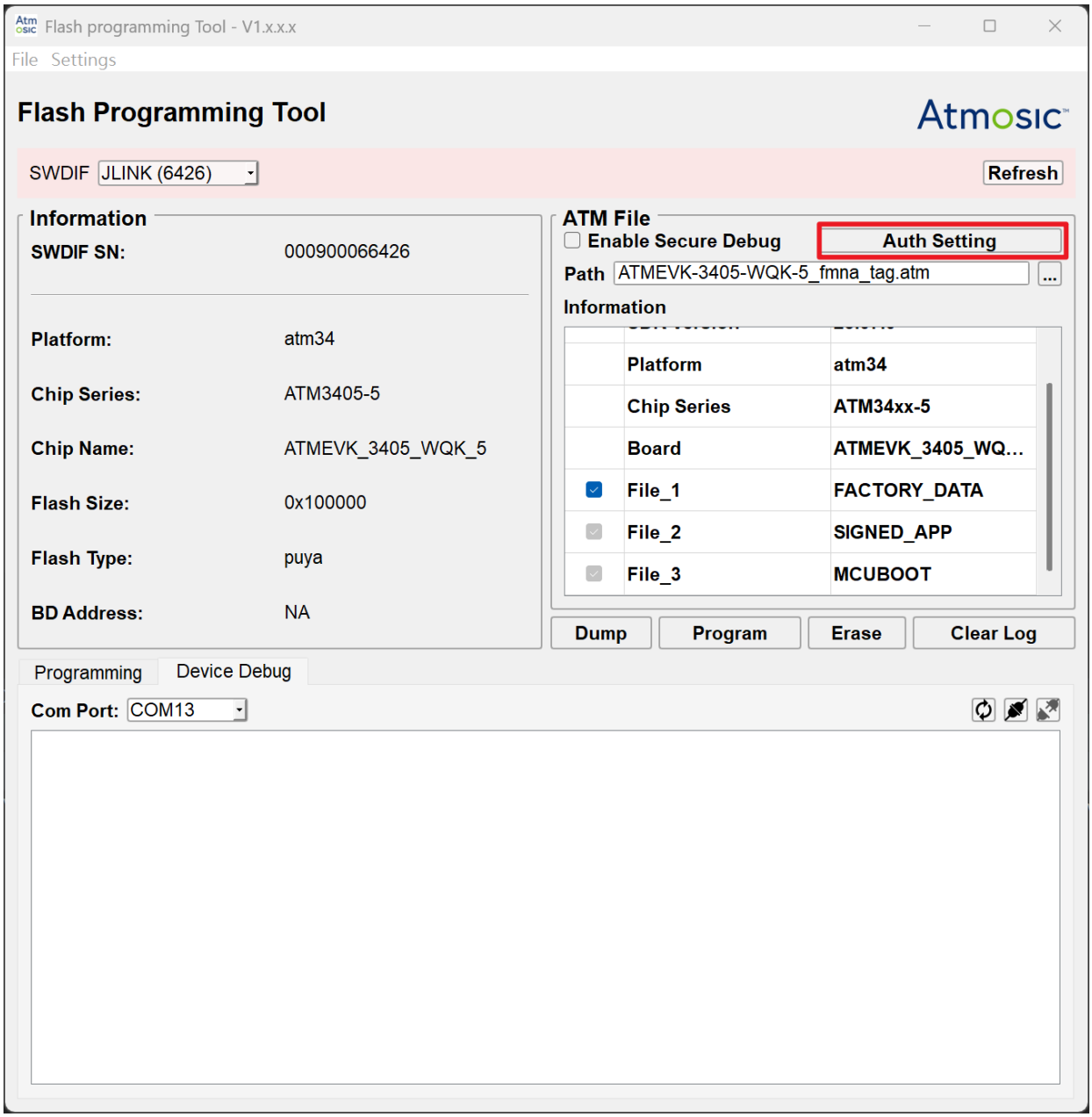


Figure 6-3 Click the Auth Setting Button to Show the Authentication Setting Dialog

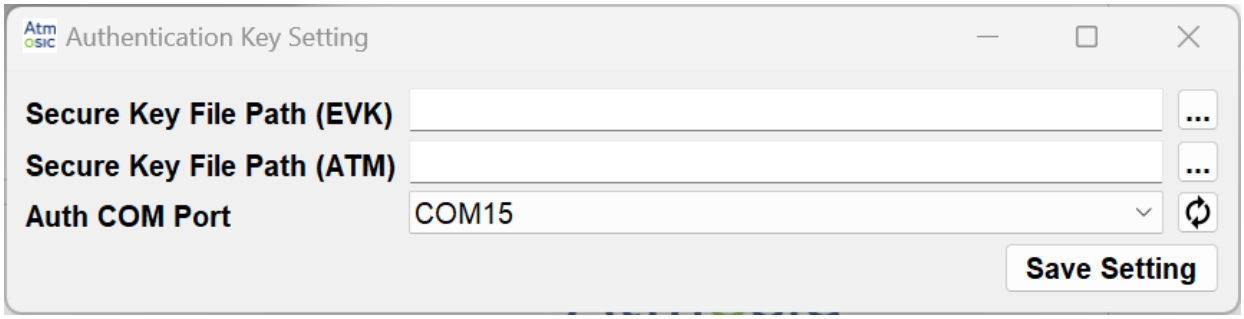


Figure 6-4 Authentication Setting Dialog

Step 4 - Click the `...` button to select the secure debug key file (If the key used for burning the firmware is different from the one on the EVK, you need to select the corresponding key file separately). Additionally, select the COM Port for the Authentication. After changes are completed, click the `Save Setting` button to save the settings and close the window.

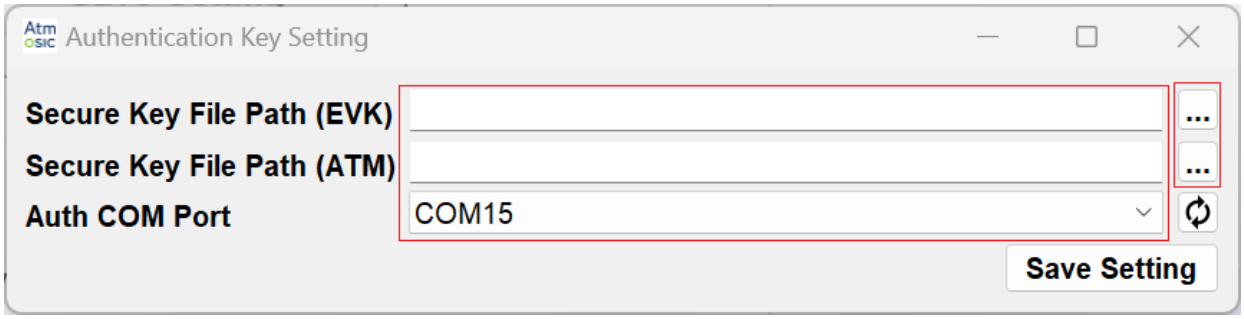


Figure 6-5 Set Authentication Setting

Step 5 - Set the `Enable Secure Debug` checkbox.

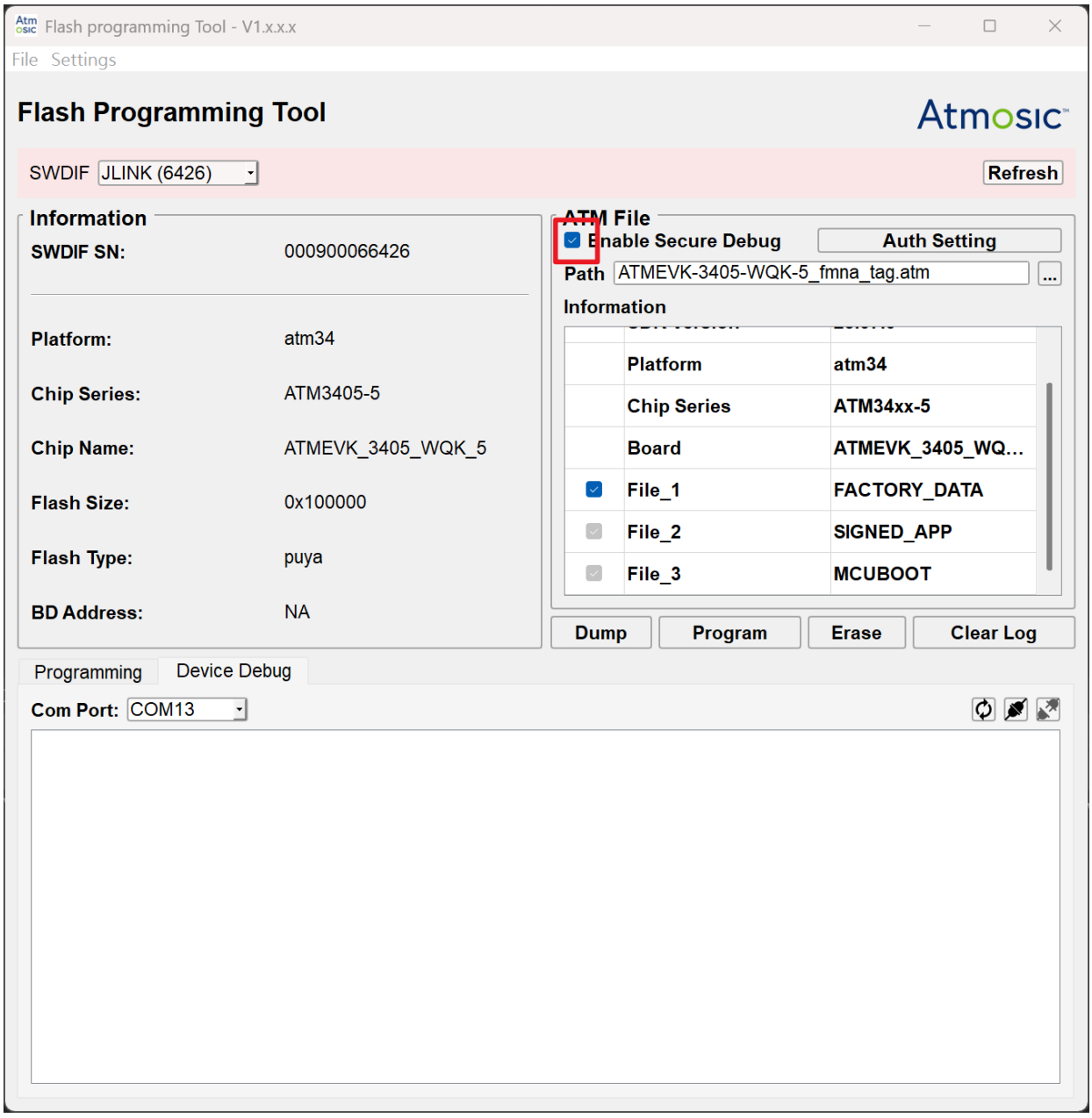


Figure 6-6 Set Enable Secure Debug Checkbox

Step 6 - If you want to modify the content of the partition to be flashed, you can change the checkbox of the FACTORY_DATA(In Bare Metal SDK, it is called NVDS) item.

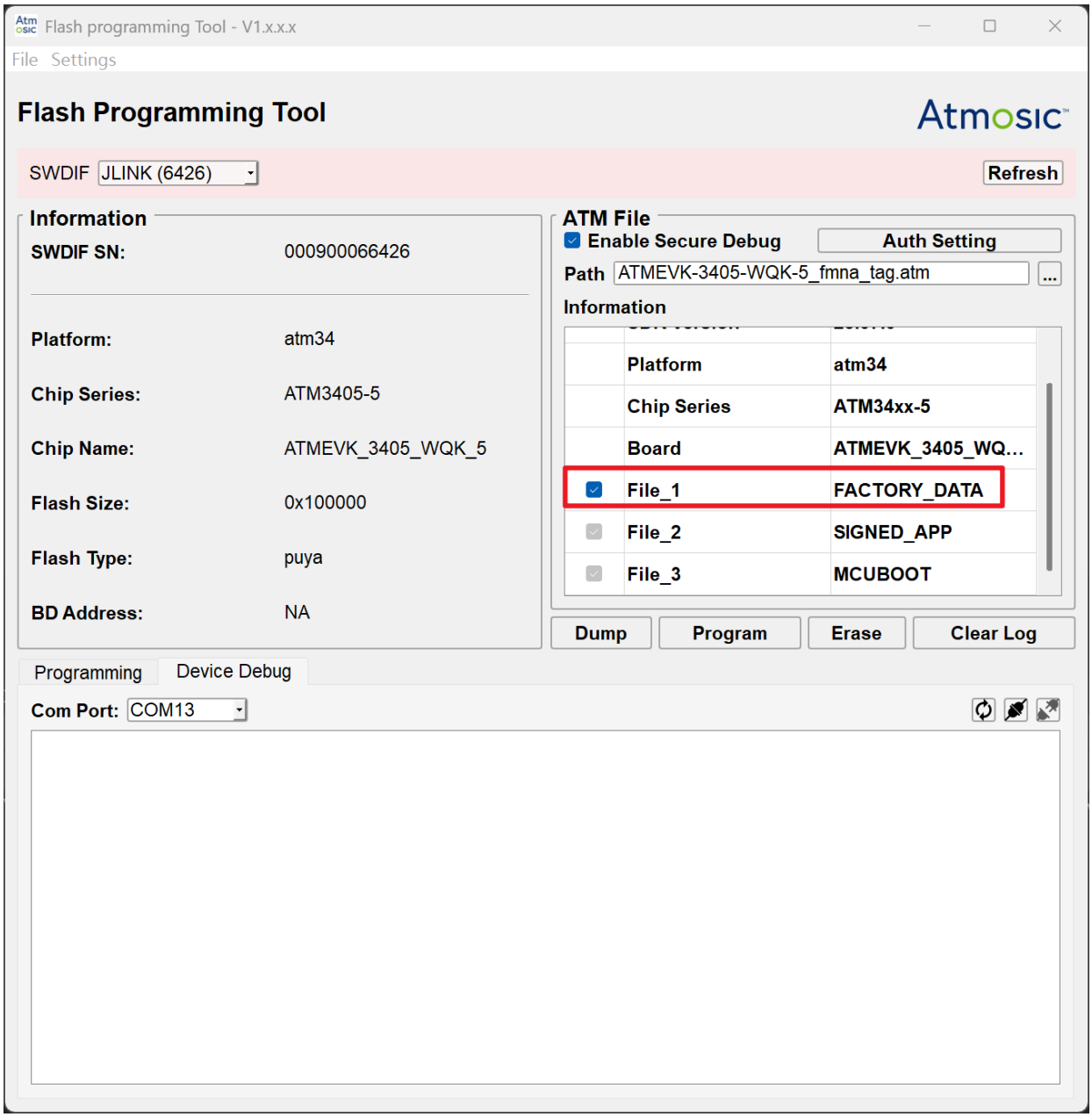


Figure 6-7 Change the Checkbox of the NVDS or FACTORY_DATA Item if Needed

Step 7 - Click the `Program` button, and the tool will pop up After pressing the `OK` button, please reset the device within three seconds (This step is only required when using J-Link for flashing).

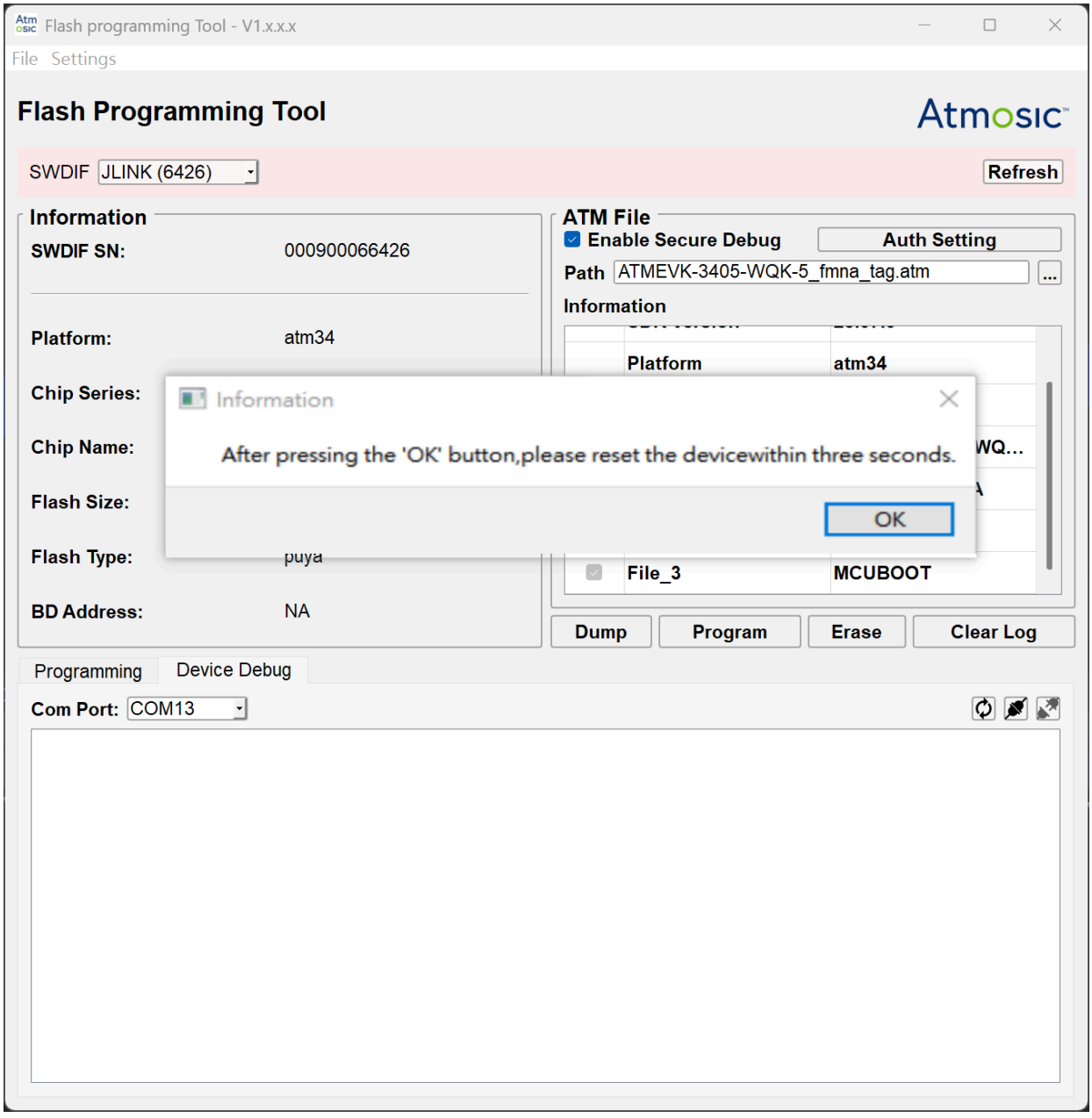


Figure 6-8 Pop-up Reset The Device Within Three Seconds Dialog

Step 8 - A Pop-up countdown screen will appear and wait for the user to reset the device (This step is only required when using J-Link for flashing).

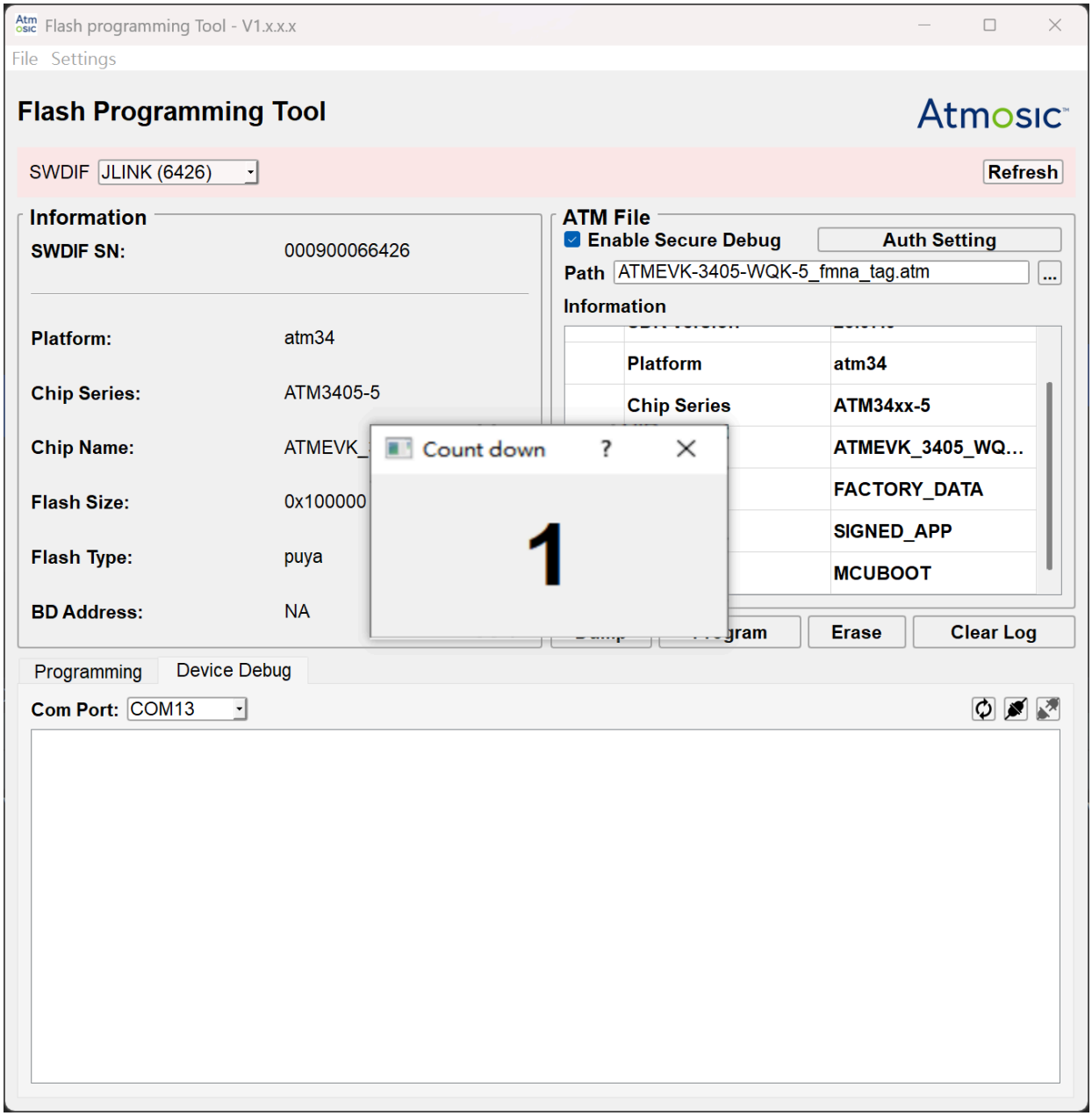


Figure 6-9 Pop-up Countdown Dialog

Step 9 - A pop-up screen will indicate successful recording when the write operation is successful.

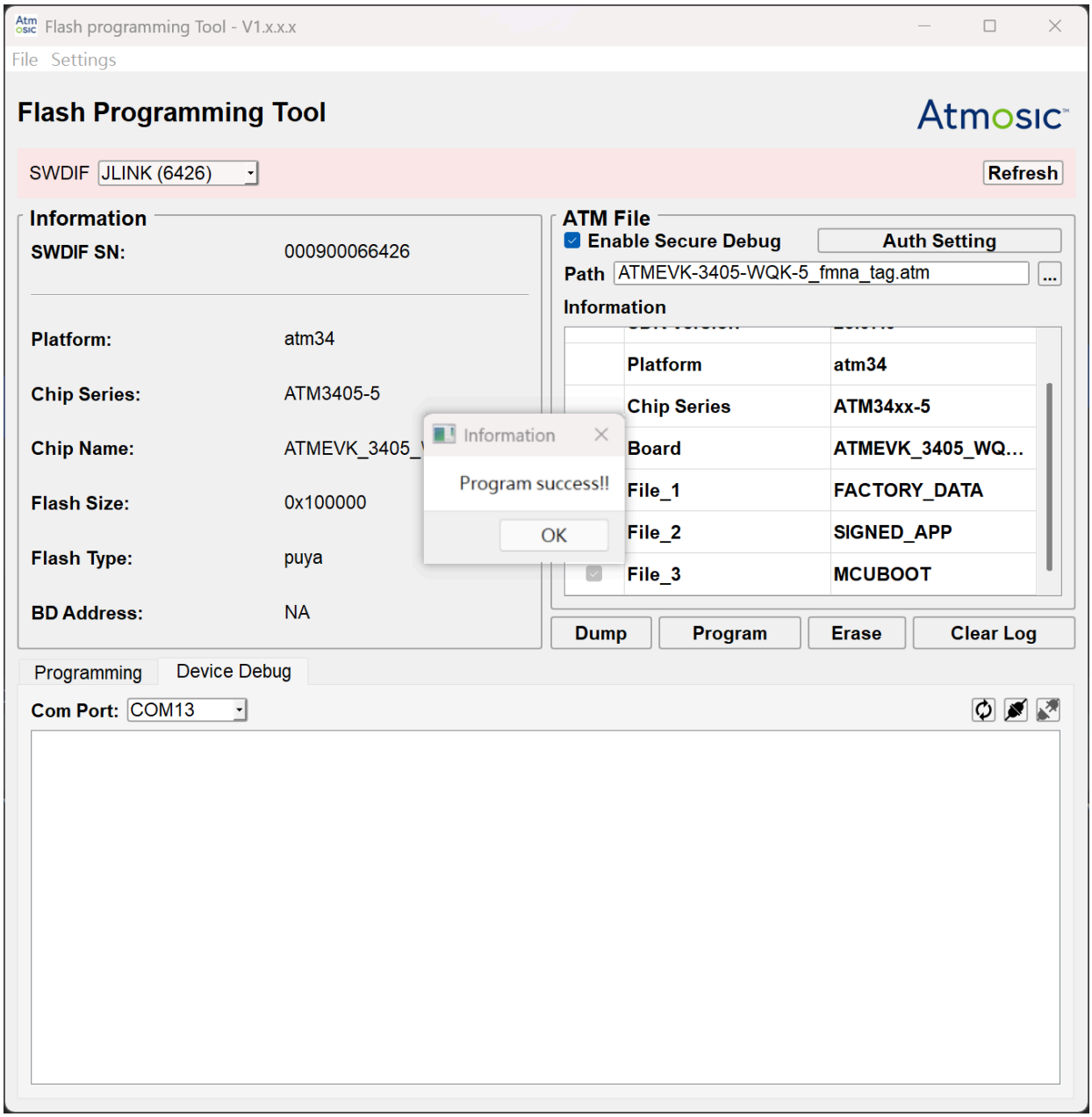


Figure 6-10 Write Flash Data Success Dialog

7. How to Dump Flash/RRAM Data From the Device

Note: *Since J-Link Commander does not support dumping flash, the flash can only be dumped using OpenOCD (RDI driver installed).*

Step 1 - Click the 'Dump' button to open the Dump Tool window.

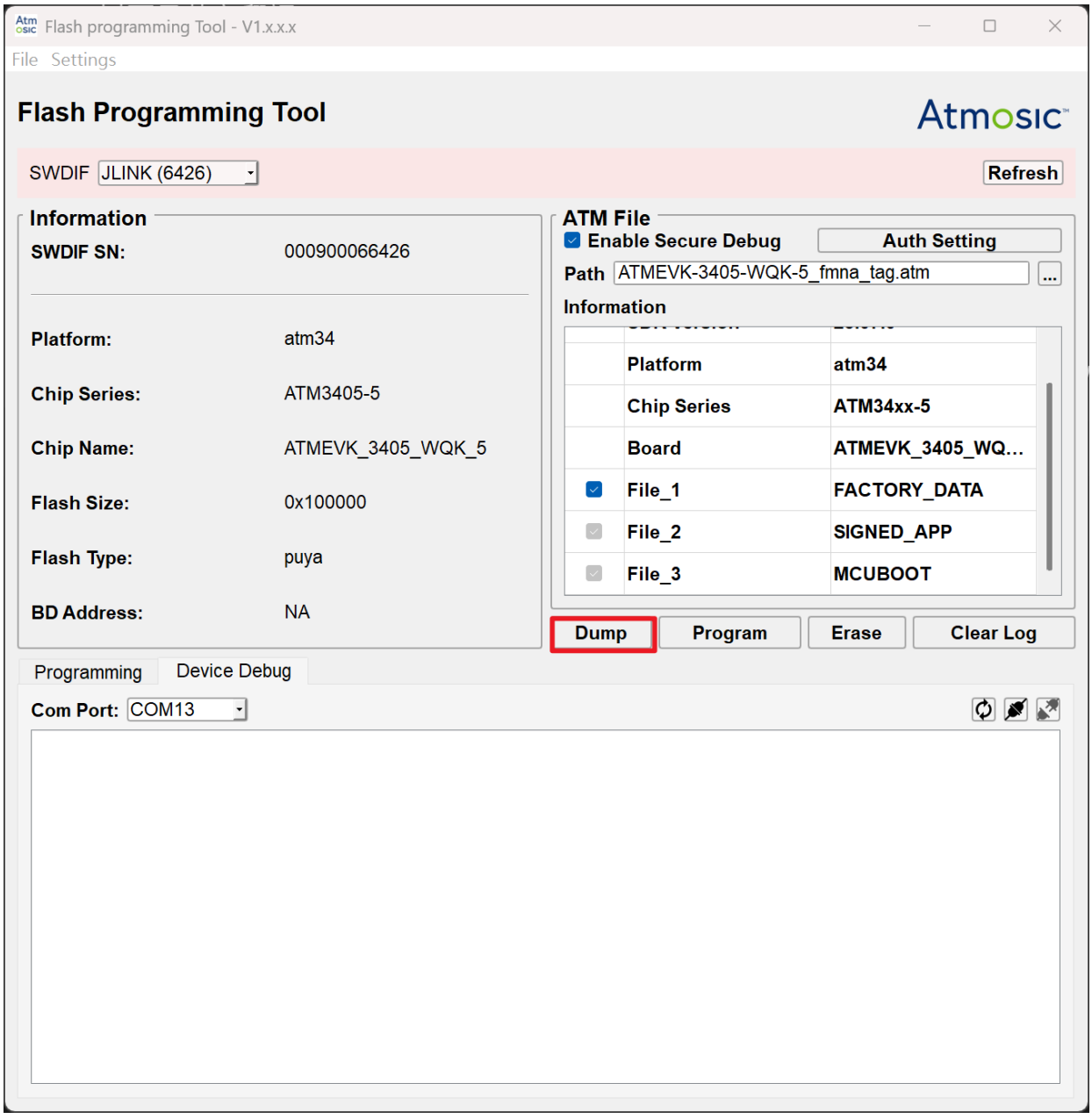


Figure 7-1 Click the Dump button to show the Dump Tool Dialog

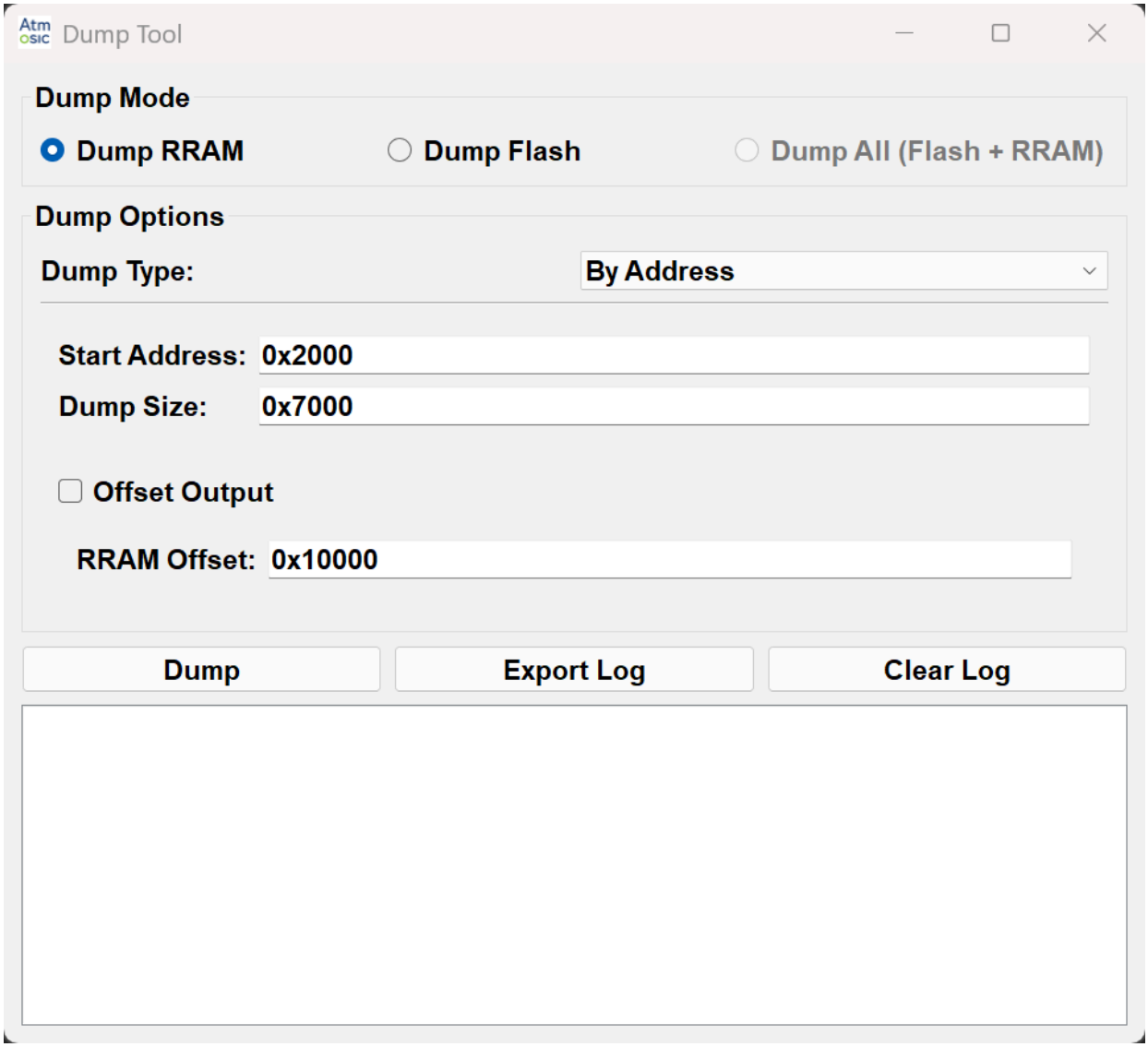


Figure 7-2 Dump Tool Dialog

Step 2 - Select the ‘Dump Mode’.

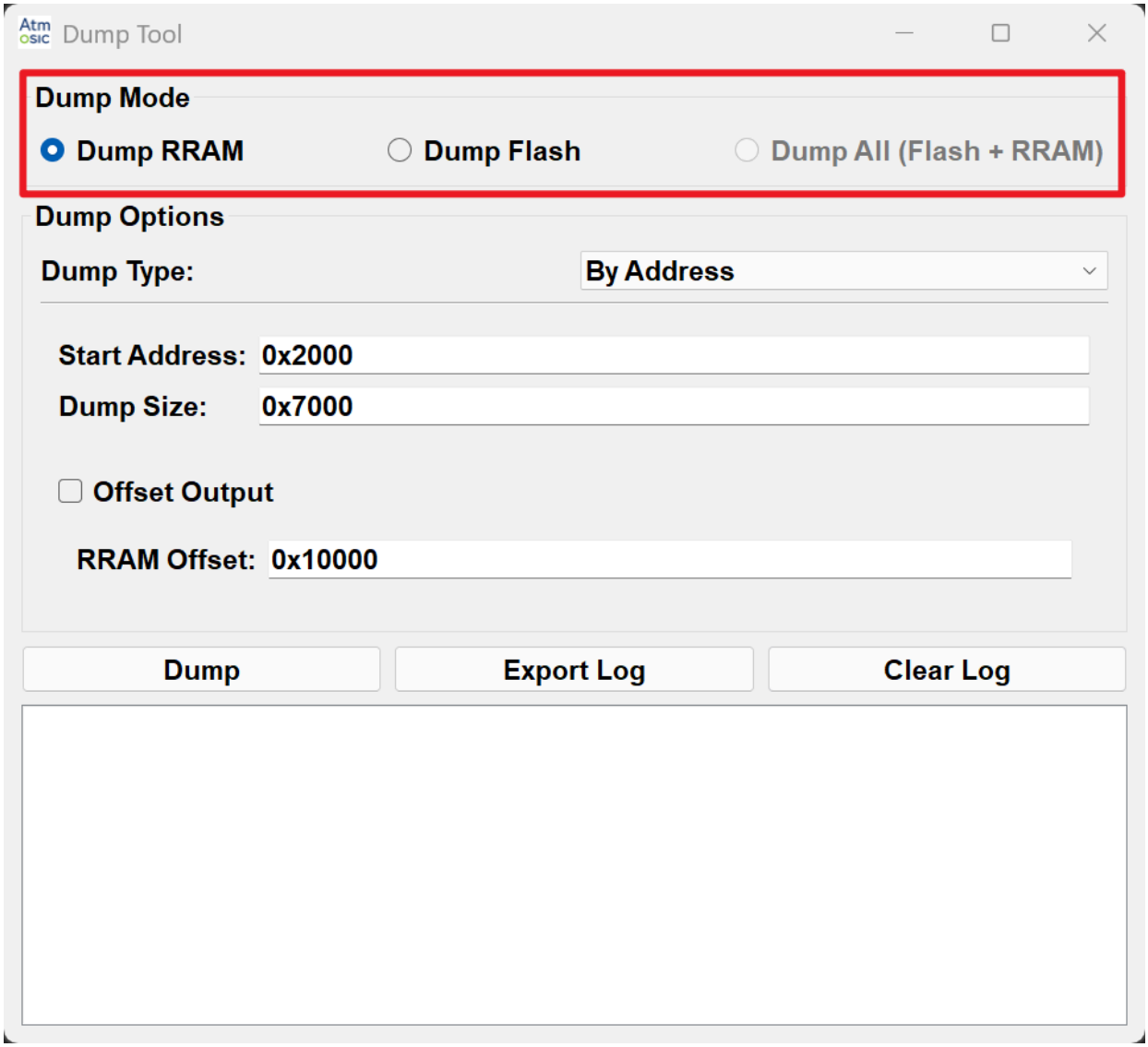


Figure 7-3 Select Dump Mode

Dump Mode includes three options:

- **Dump RRAM**

  Read the RRAM data.

- **Dump Flash**

  Read the Flash/Ext Flash data.

- **Dump All**

  Read RRAM/Flash/Ext Flash data (This option is only available when the Dump Type is set to 'All').

Step 3 - Select the ‘Dump Options’.

Dump Options include three Dump Types:

- **By Address**

Specify the address directly (User must enter the address and size information below in hexadecimal format). If the user wants to perform ‘Dump All’, the user can refer to the information below to enter the Address and Size:
- RRAM => Start Address: 0x10000, Size: 0x7F800
- FLASH => Start Address: 0x200000, Size: 0x100000

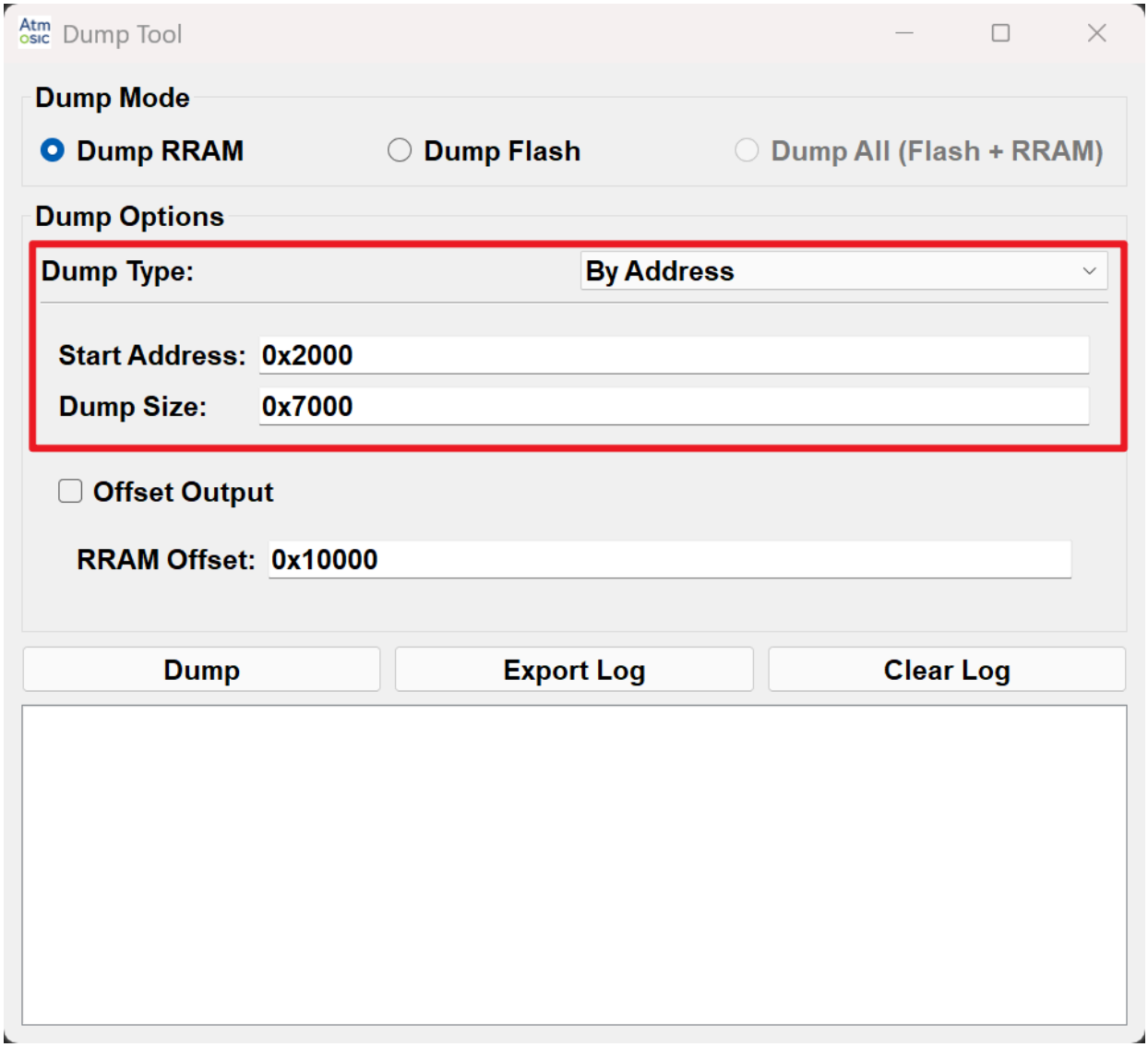


Figure 7-4 Dump Type (By Address)

- **By Partition**

Use the partition address from the selected ATM file (only shown when an ATM file is selected).

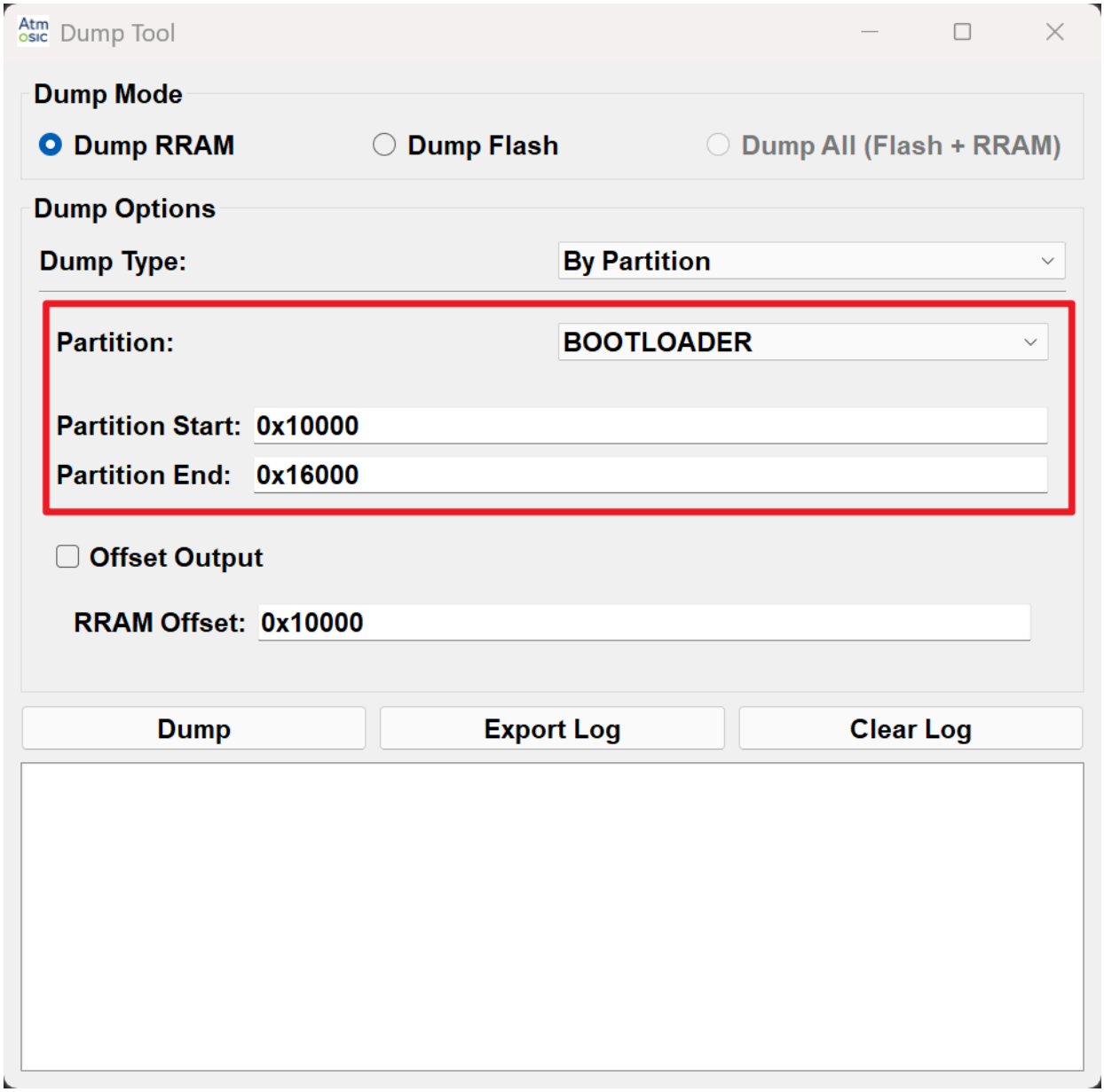


Figure 7-5 Dump Type (By Partition)

- **All**

  Dump all RRAM or all Flash/Ext Flash data (only shown when an ATM file is selected).

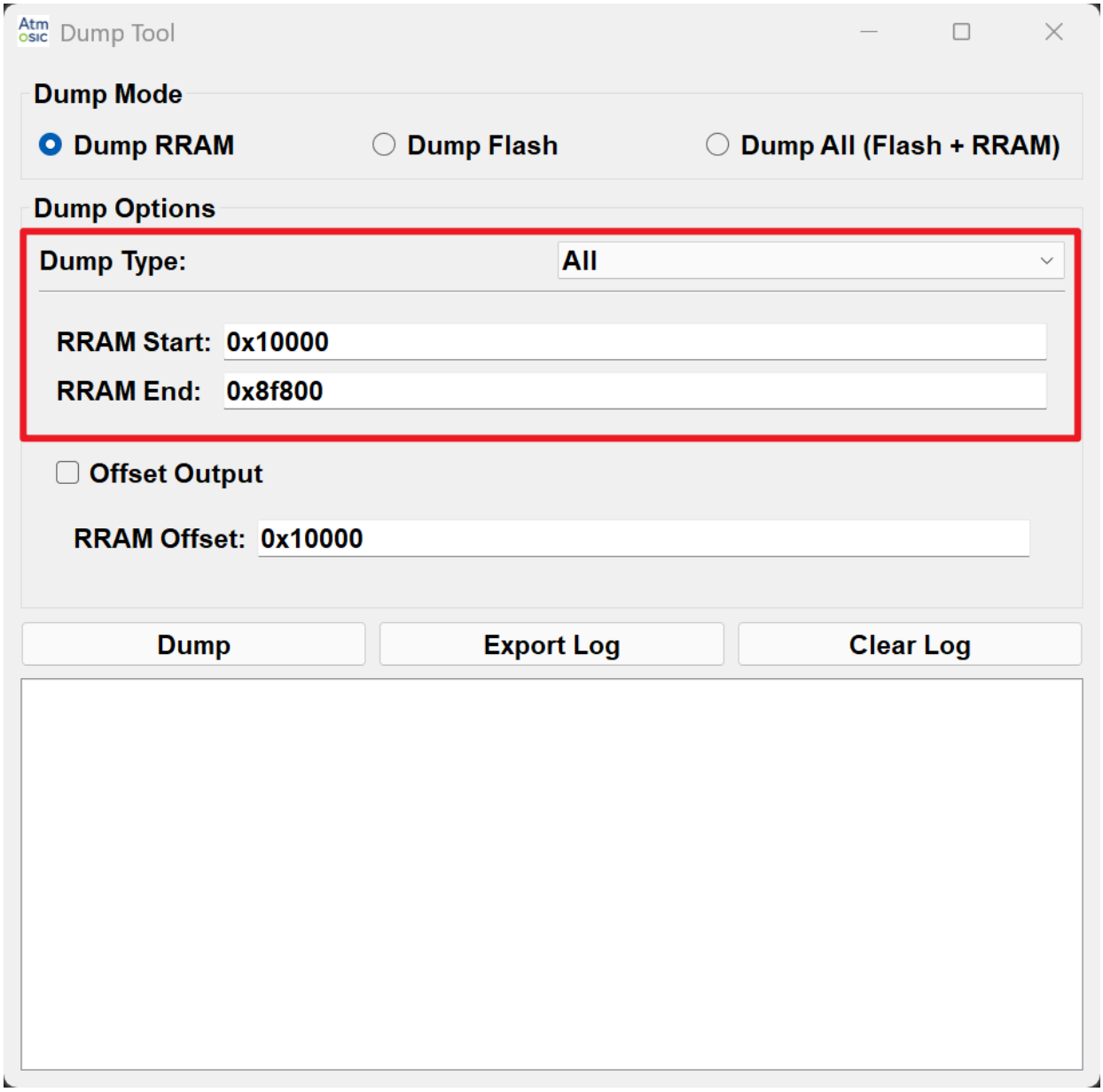


Figure 7-6 Dump Type (All)

Step 4 - If you want the dumped file to follow the address offsets defined in the Layout Info, you can enable **Offset Output** so that the dumped file better matches the current device's address configuration.

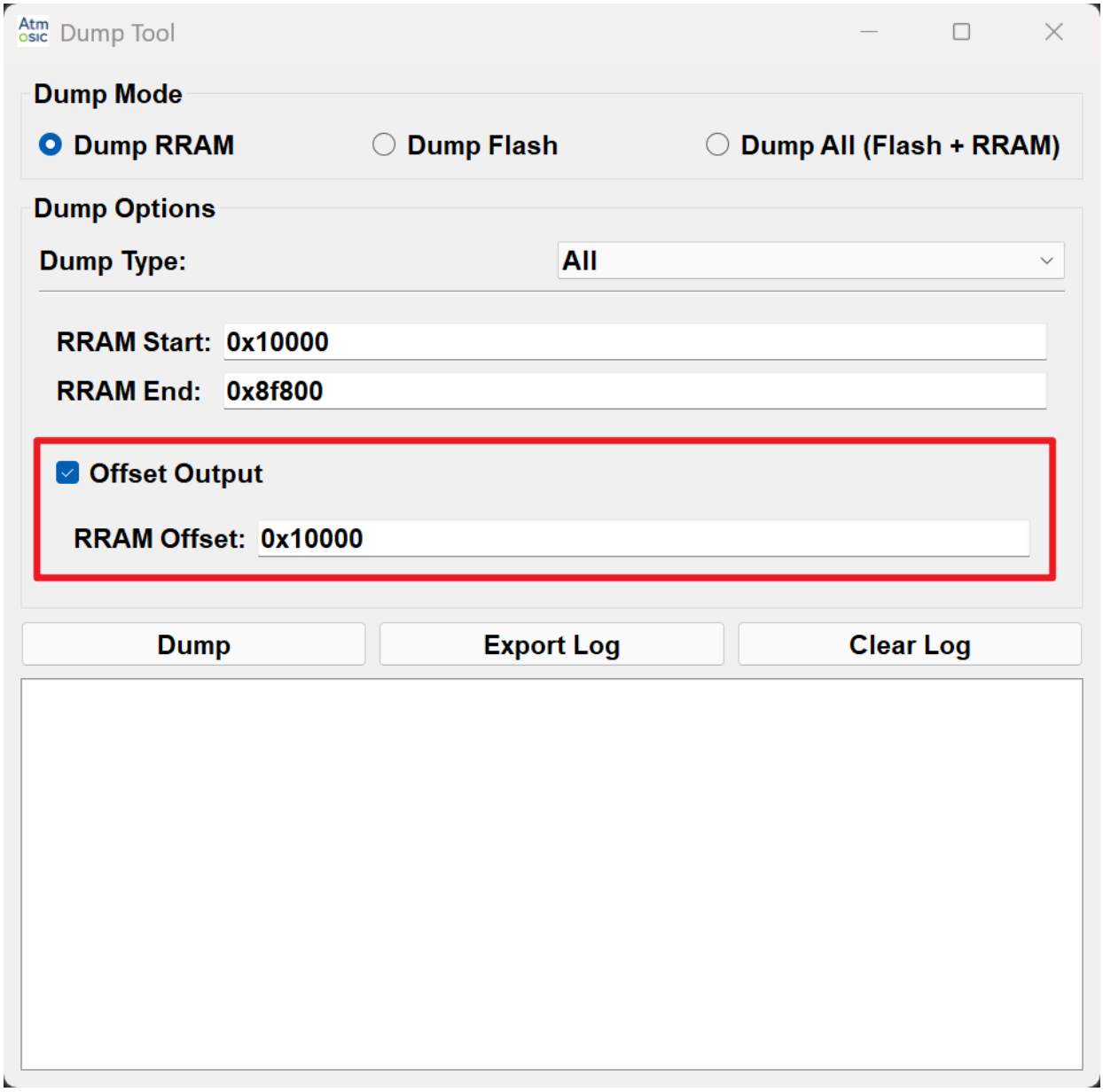


Figure 7-7 Offset Output

Step 5 - Click the `Dump` button to dump an image file from EVK (During the operation, you will be prompted to select the dump path as an image file). A pop-up screen will indicate successful recording when the write operation is successful.

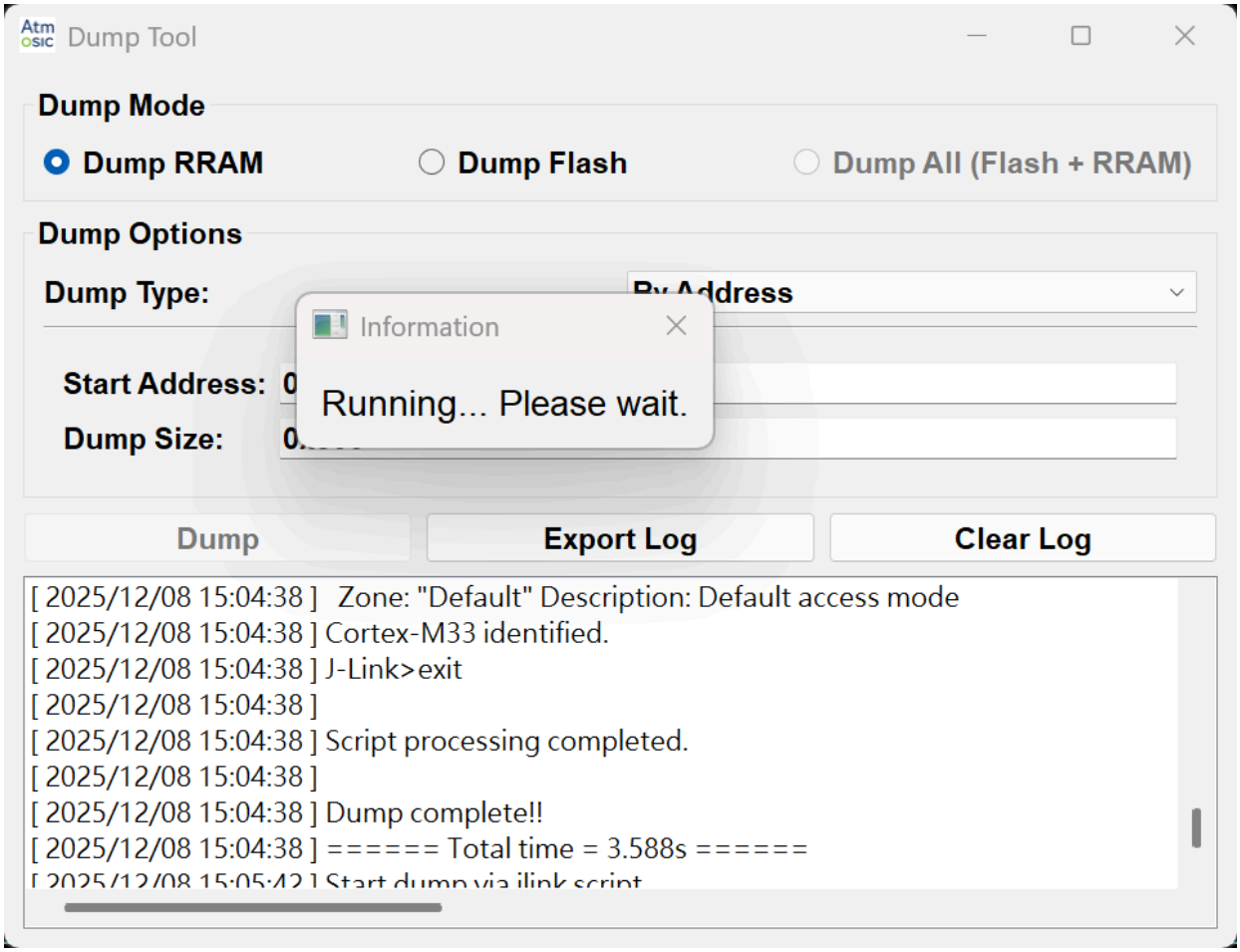


Figure 7-8 Dump Data In-Progress Dialog

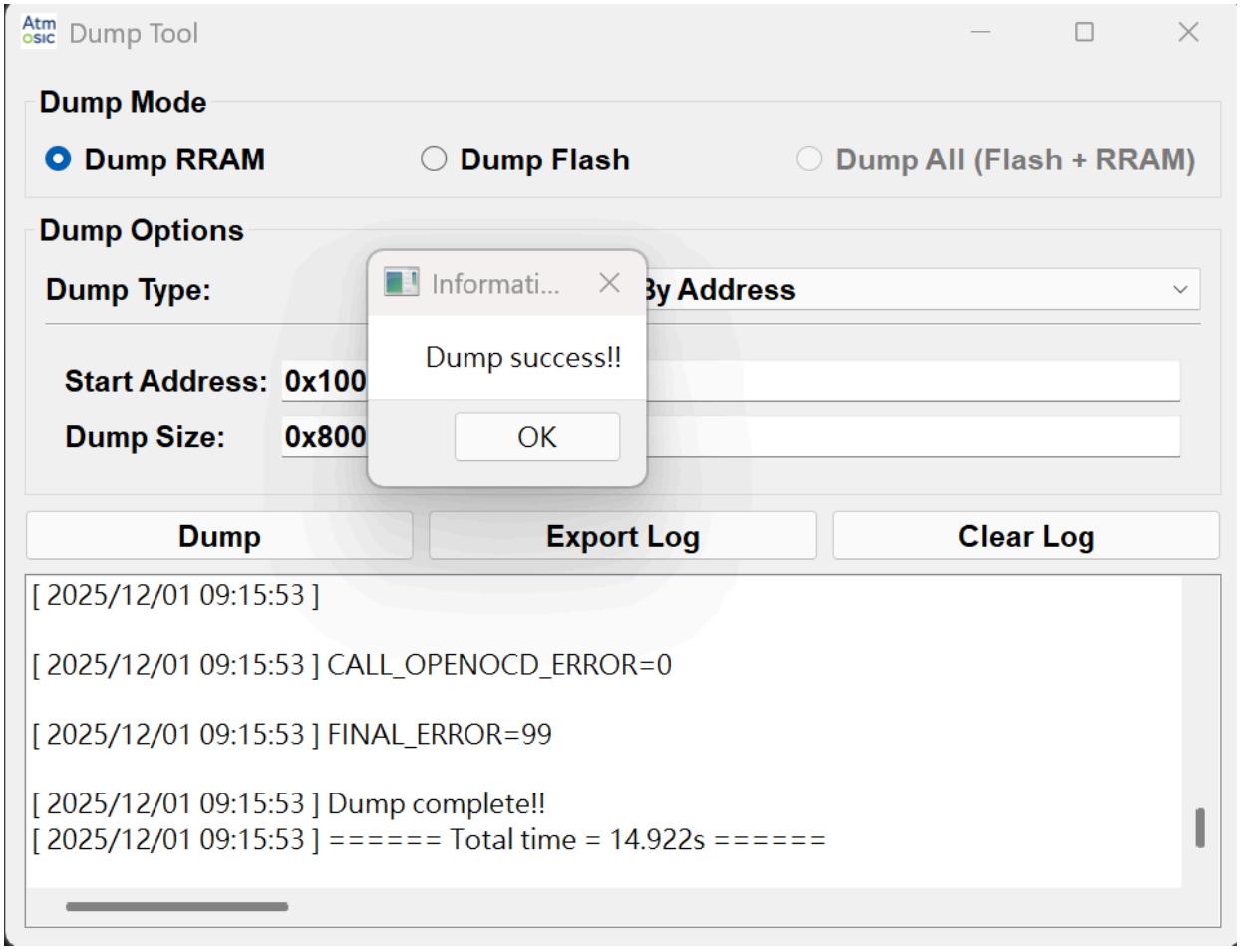


Figure 7-9 Dump Data Success Dialog

Step 6 - Click the `Export Log` button to save the current log.

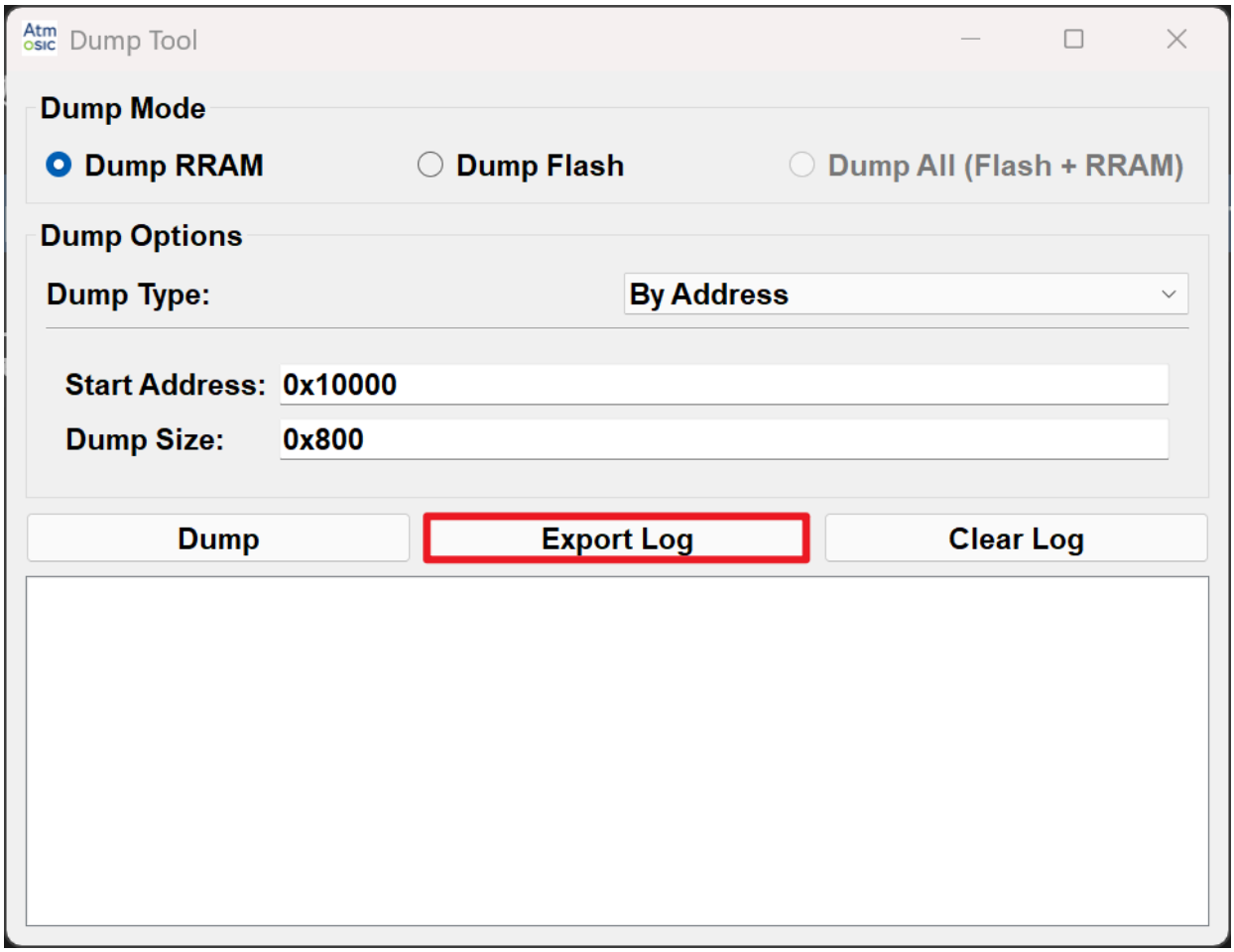


Figure 7-10 Export Dump Log

Step 7 - Click the `Clear Log` button to clear the current log.

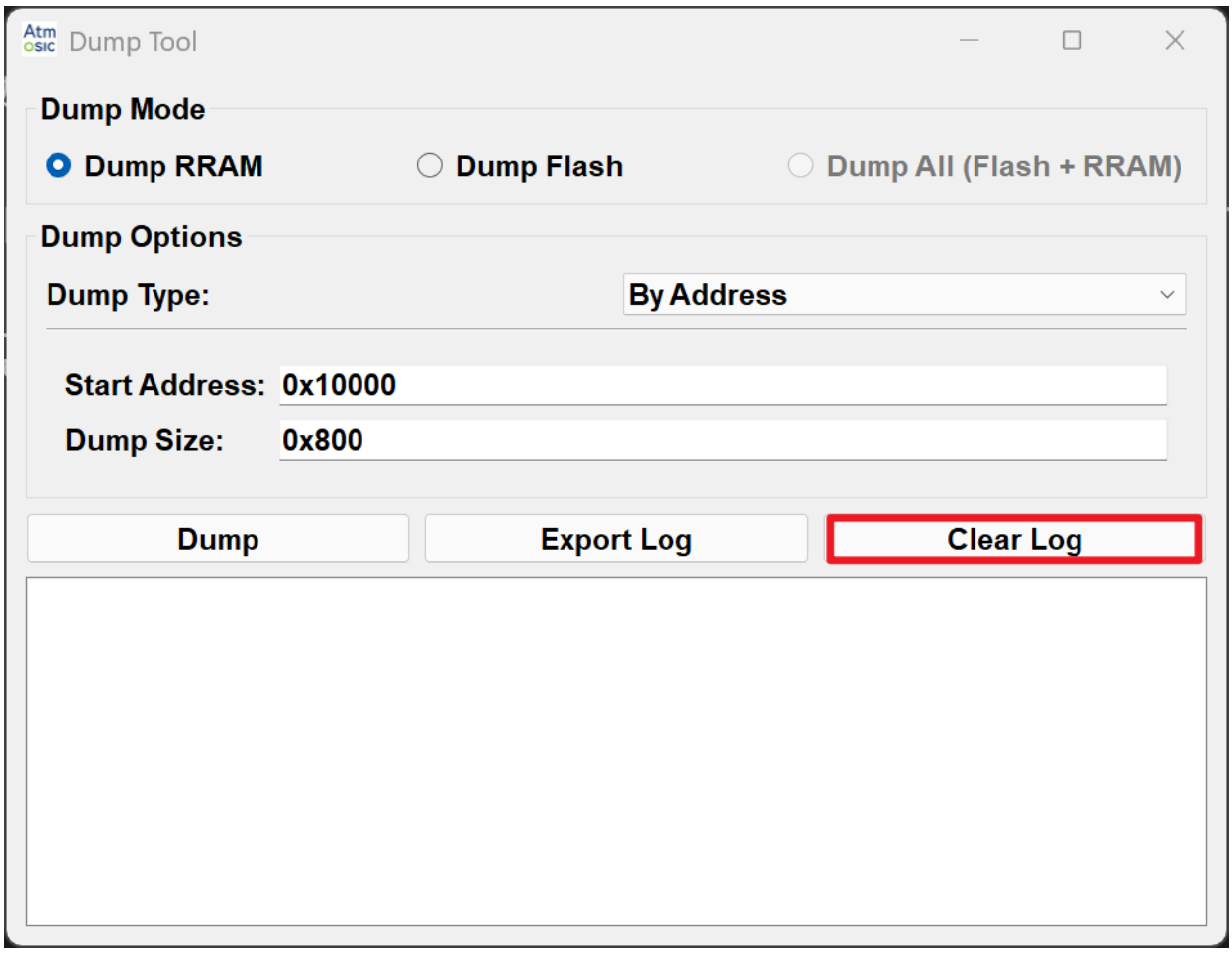


Figure 7-11 Clear Dump Log

8. How to Erase Flash/RRAM Data on the Device

Step 1 - Click the 'Erase' button to open the EraseTool window.

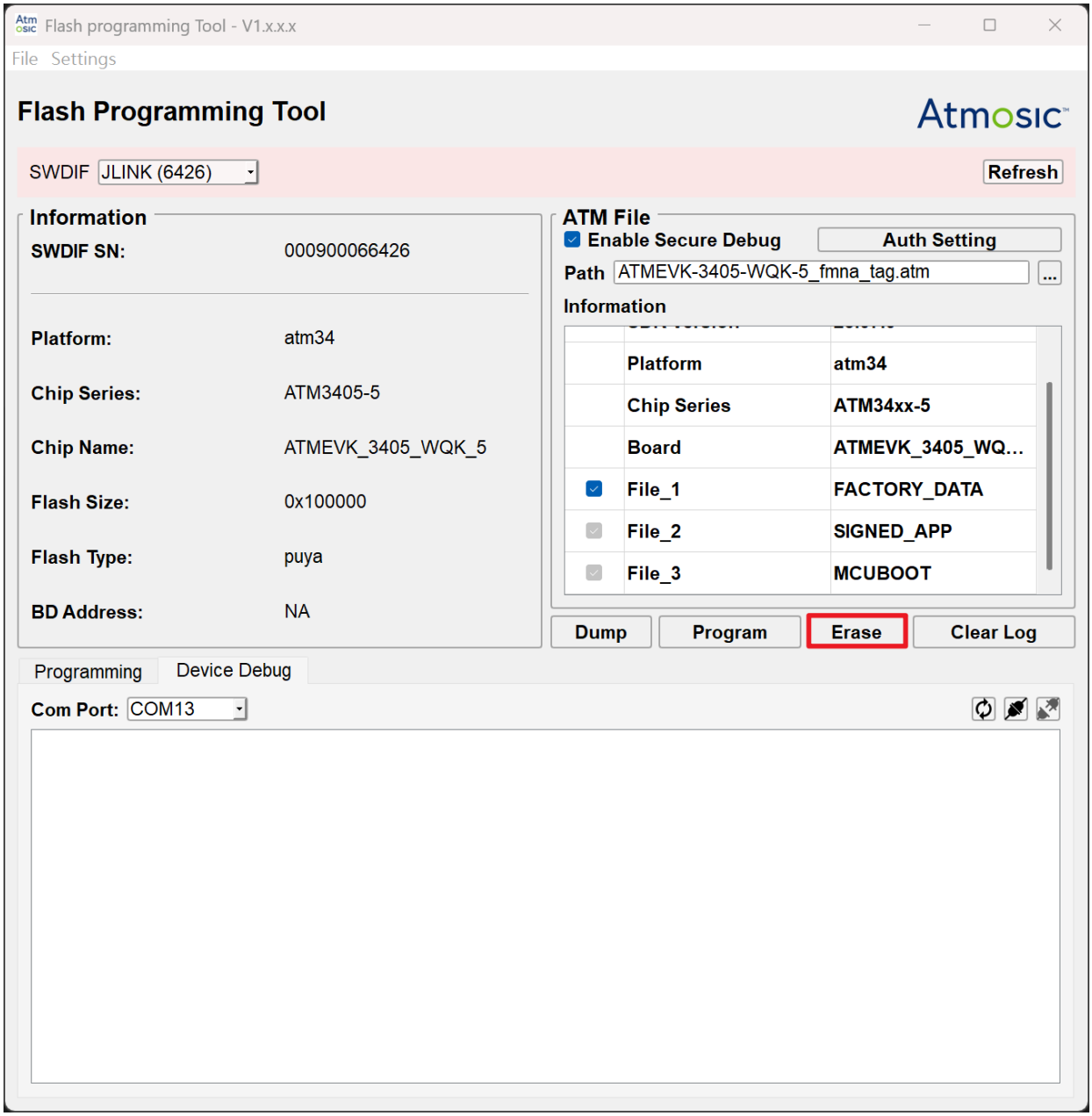


Figure 8-1 Click the Erase button to show the Erase Tool Dialog

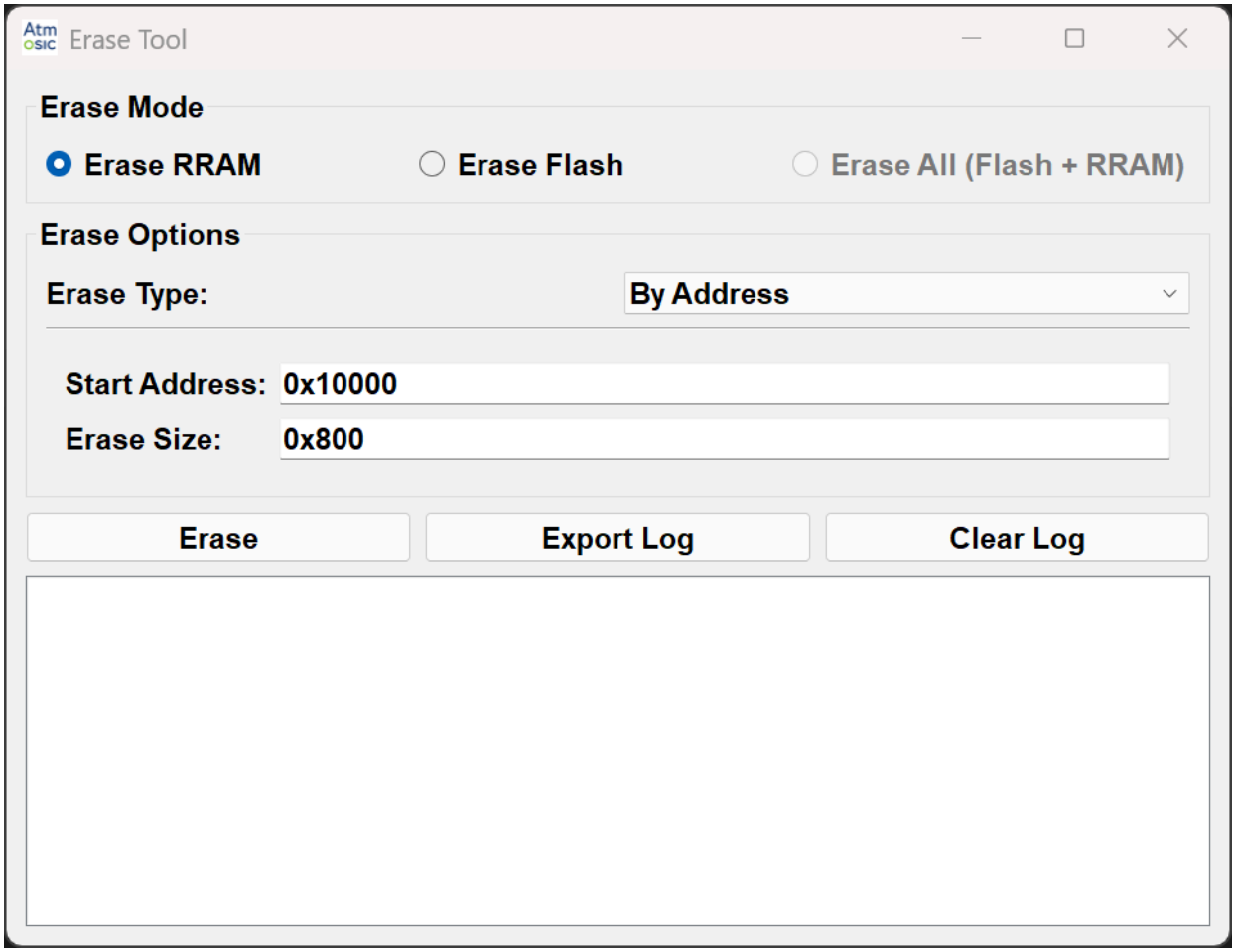


Figure 8-2 Erase Tool Dialog

Step 2 - Select the ‘Erase Mode’.

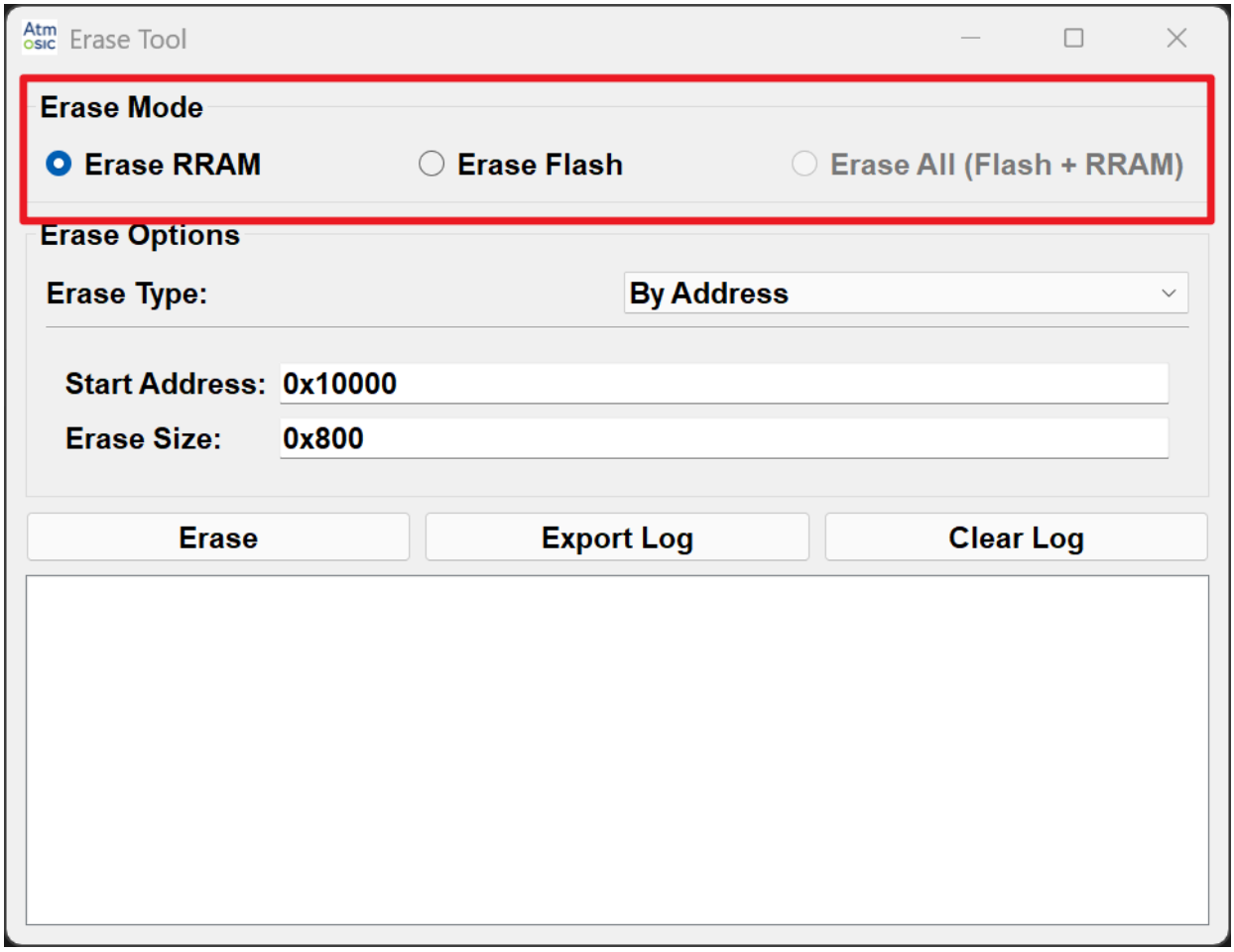


Figure 8-3 Select Erase Mode

Erase Mode includes three options:

- **Erase RRAM**

  Erase the RRAM data.

- **Erase Flash**

  Erase the Flash/Ext Flash data.

- **All**

  Erase RRAM/Flash/Ext Flash data (This option is only available when the Erase Type is set to 'All').

Step 3 - Select the ‘Erase Type’.

Erase Types include three options:

- **By Address**

  Specify the address directly (You must enter the address and size information below in hexadecimal format). If you want to perform ‘Erase All’, you can refer to the information below to enter the Address and Size:
  - RRAM => Start Address: 0x10000, Size: 0x7f800
  - FLASH => Start Address: 0x200000, Size: 0x100000

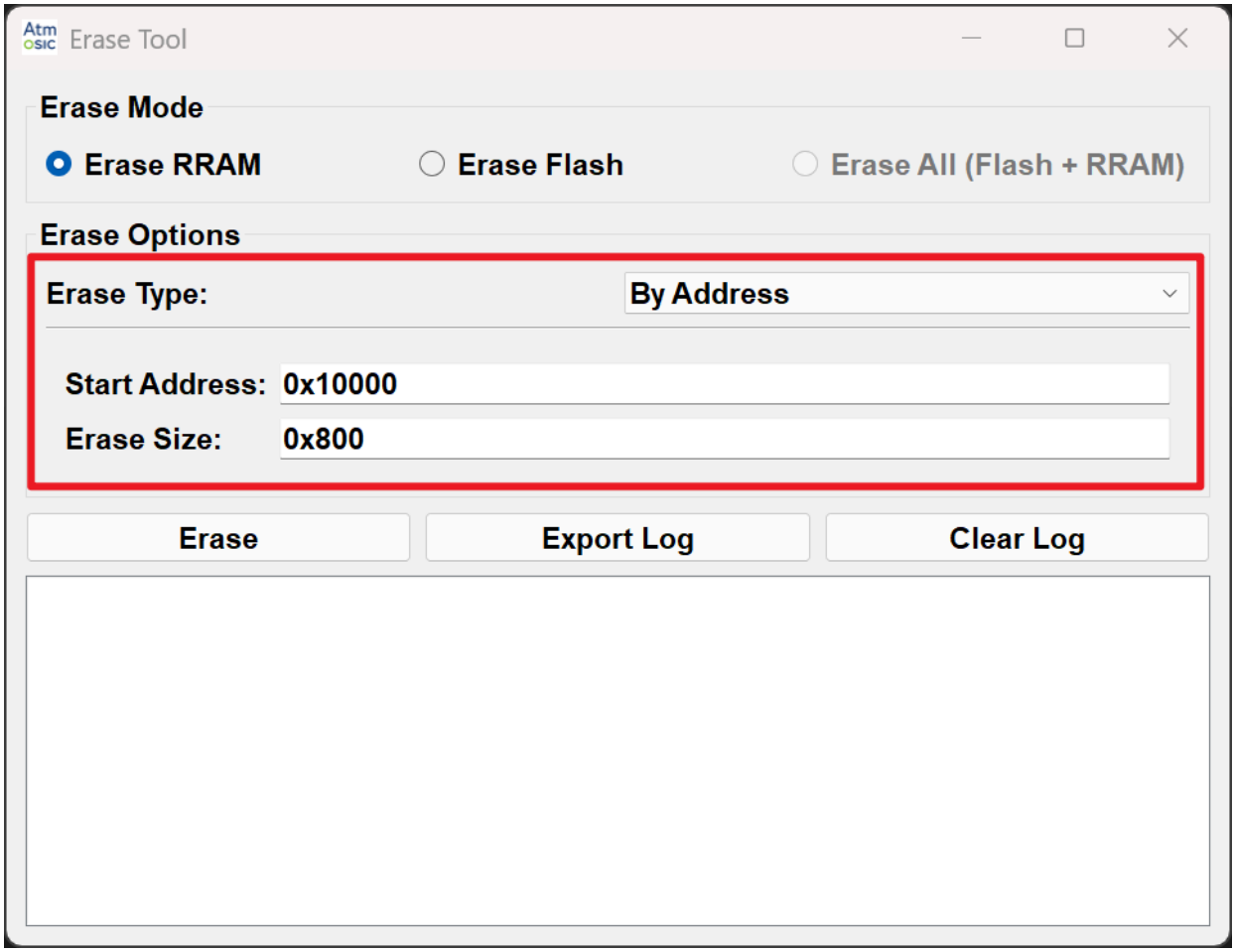


Figure 8-4 Erase Type (By Address)

- **By Partition**

  Use the partition address from the selected ATM file (only shown when an ATM file is selected).

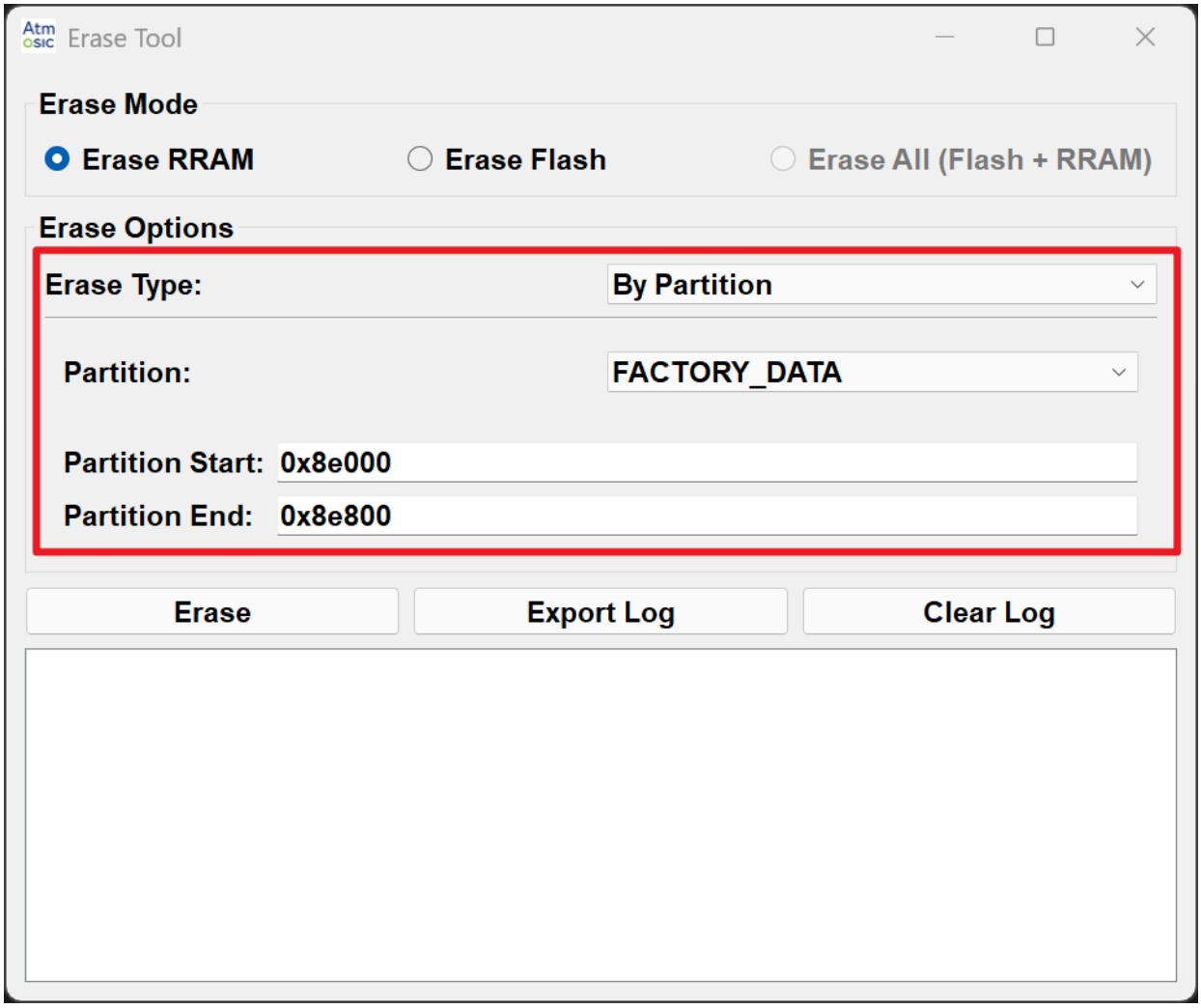


Figure 8-5 Erase Type (By Partition)

- **All**

  Erase all RRAM or all Flash/Ext Flash data (only shown when an ATM file is selected).

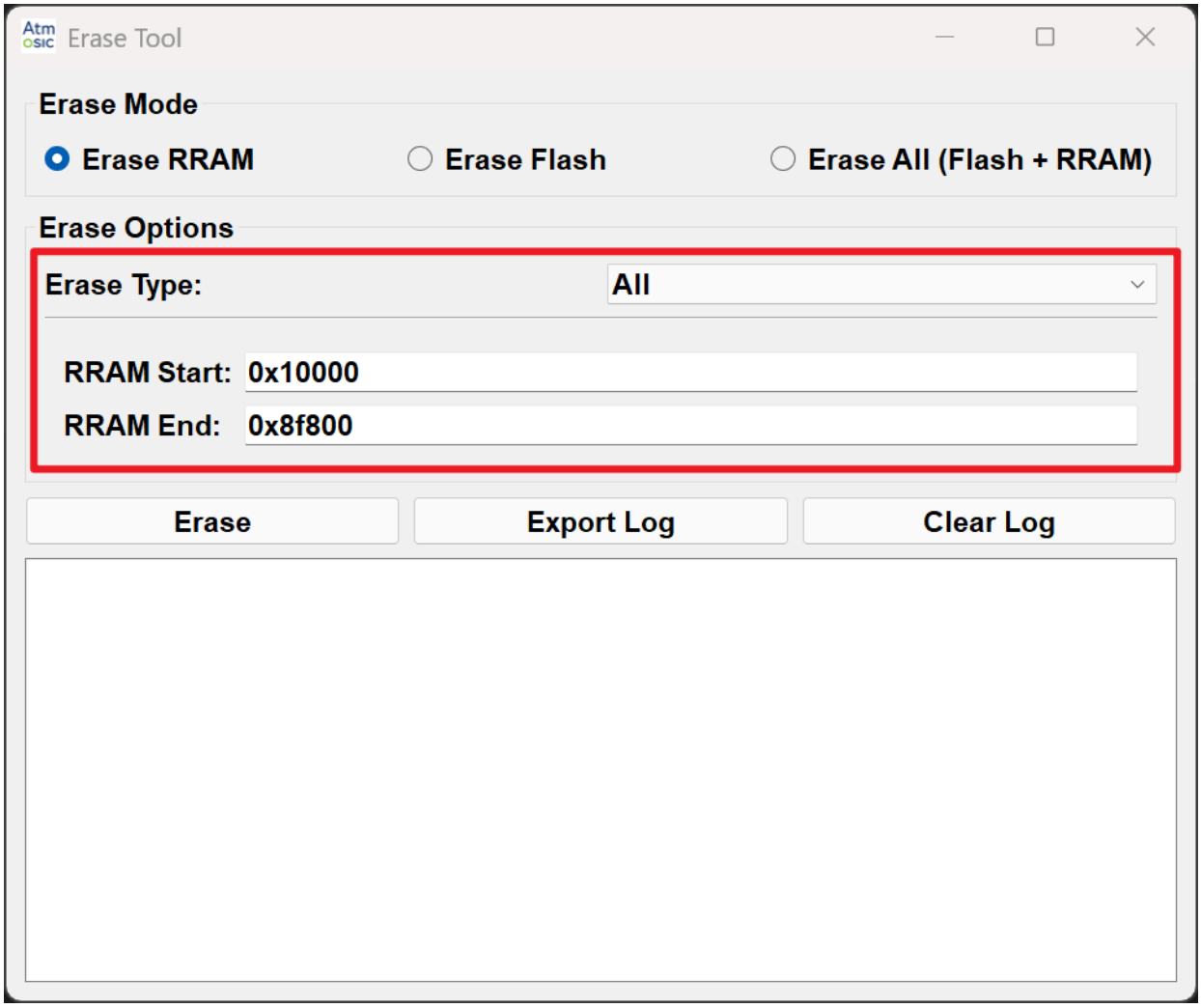


Figure 8-6 Erase Type (All)

Step 4 - Click the `Erase` button to erase EVK data. A pop-up screen will indicate successful recording when the write operation is successful.

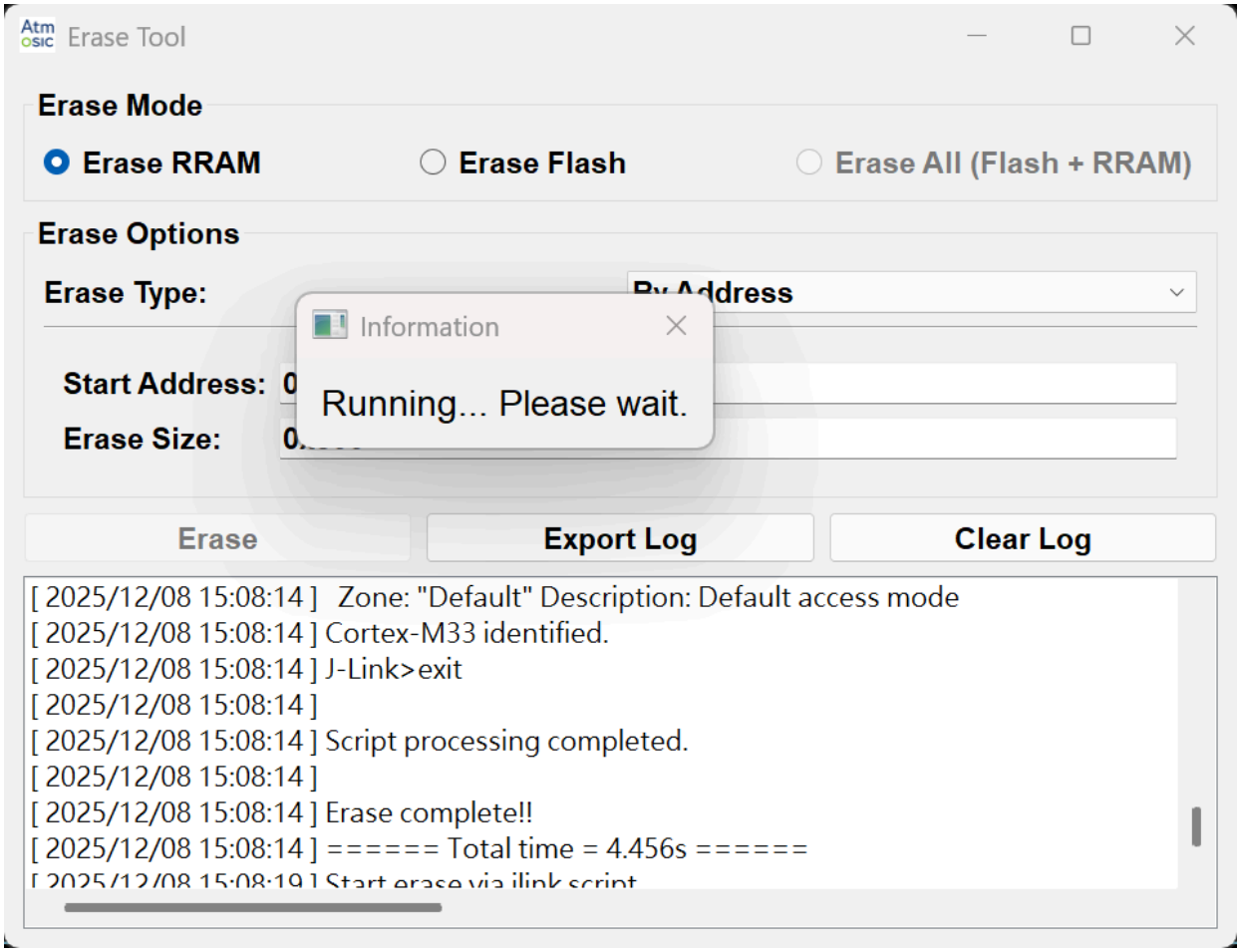


Figure 8-7 Erase Data In-Progress Dialog

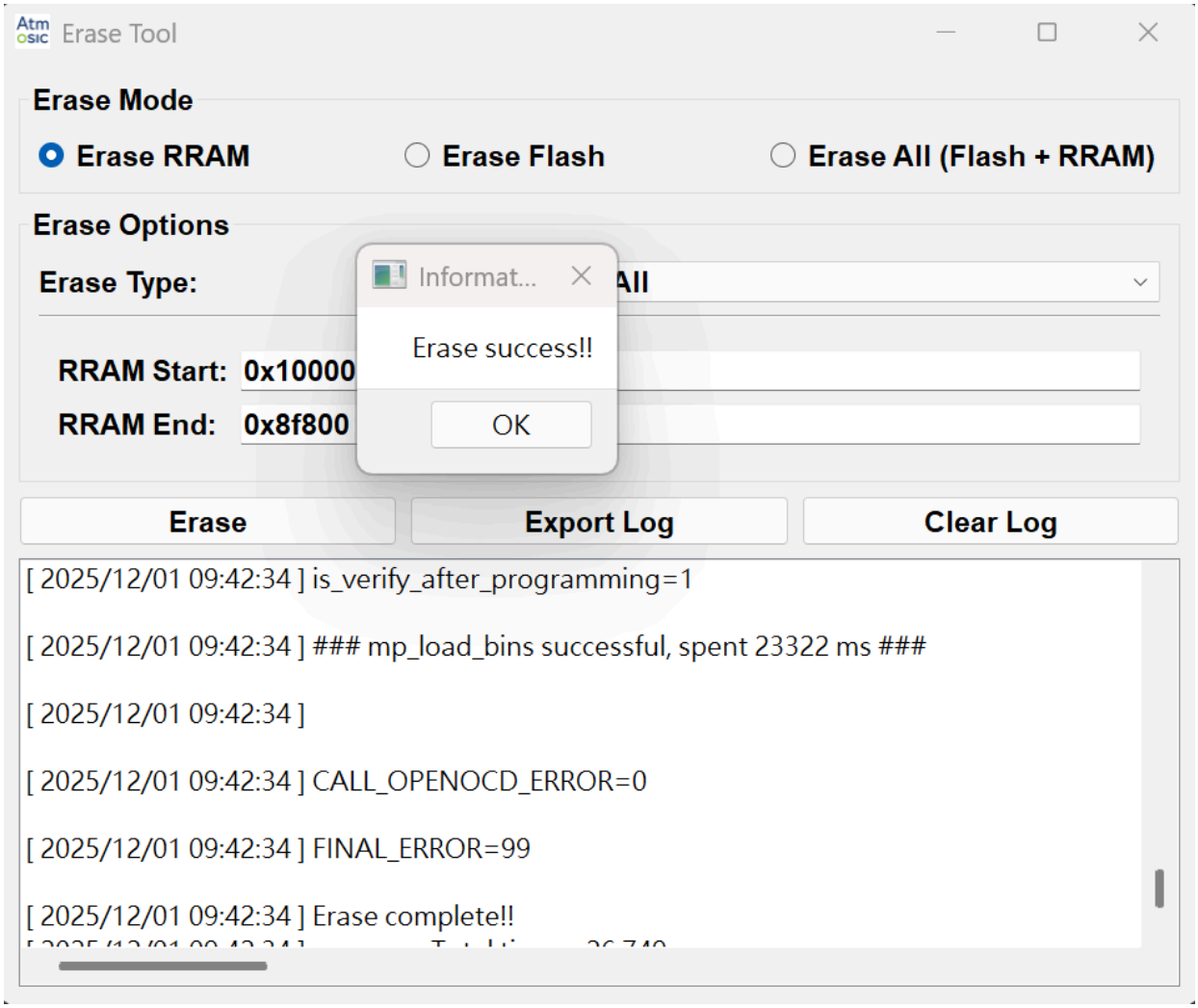


Figure 8-8 Erase Data Success Dialog

Step 5 - Click the `Export Log` button to save the current log.

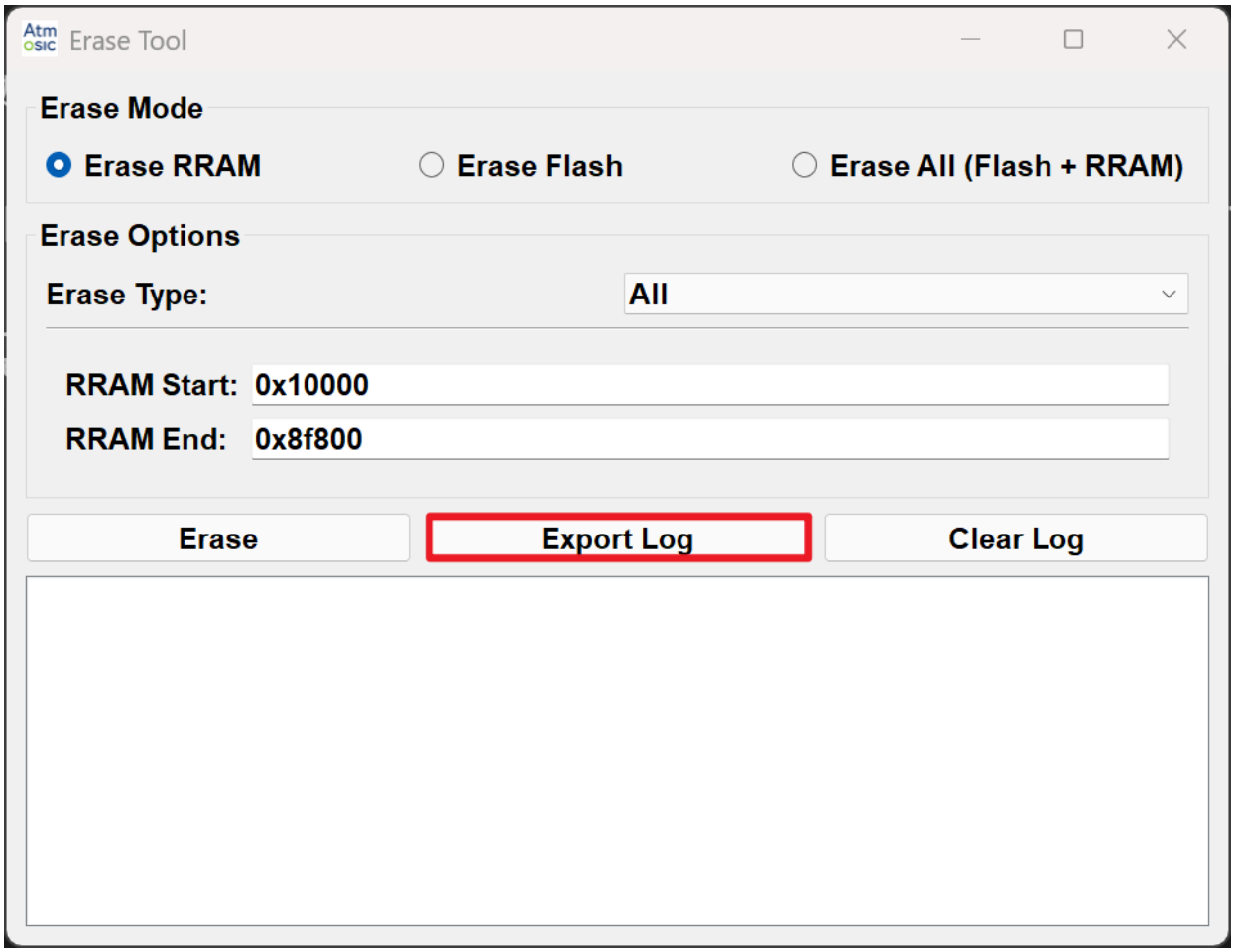


Figure 8-9 Export Dump Log

Step 6 - Click the `Clear Log` button to clear the current log.

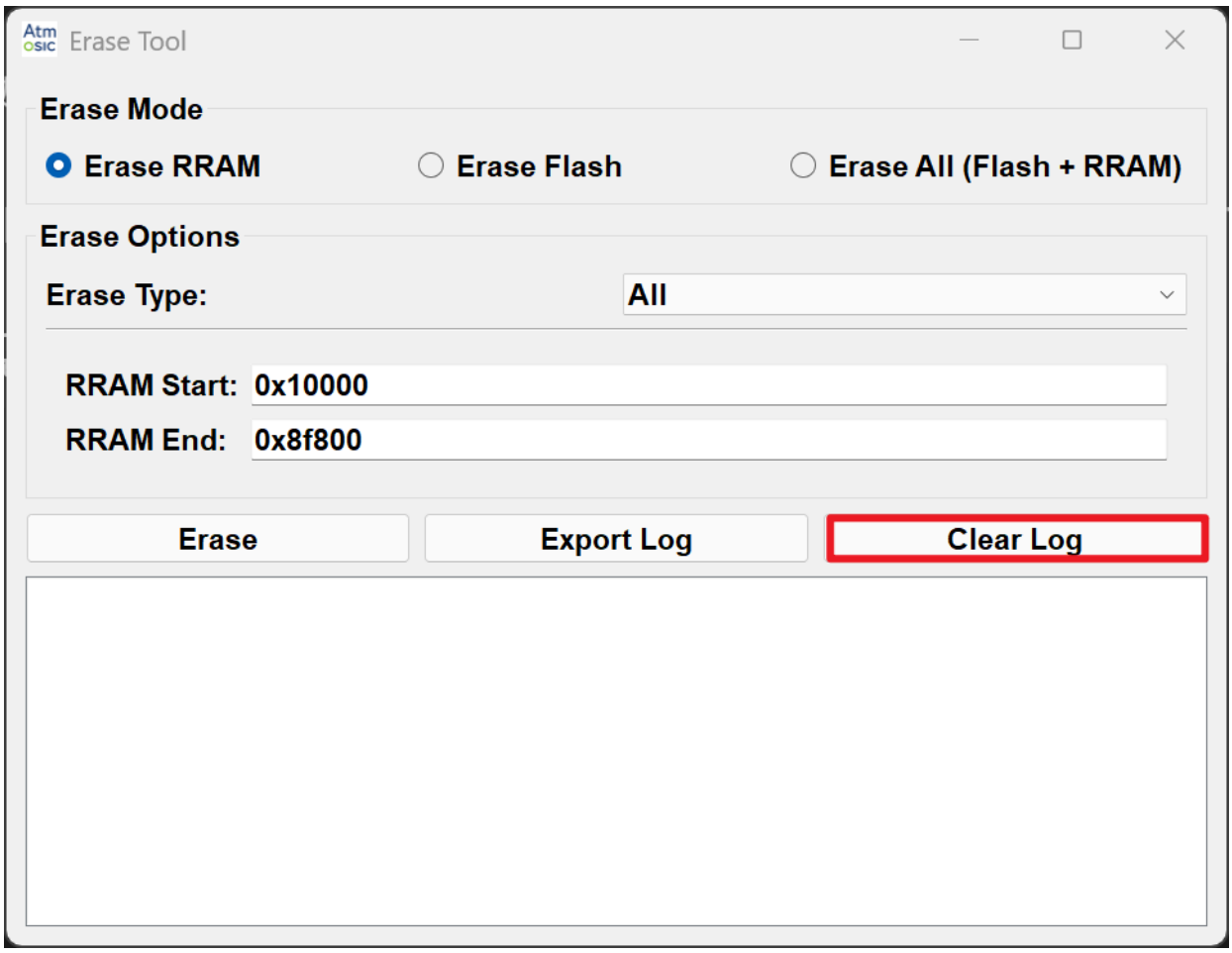


Figure 8-10 Clear Dump Log

9. Troubleshooting

If there is a pop-up error message during execution, the user can troubleshoot the problem by referring to the error messages in Table 9-1.

Index	Error message	Troubleshoot
1	Setting.xml not found	The setting.xml in the executable file root directory doesn't exist.
2	SdkValues.xml not found	The SdkValues.xml in the executable file root directory doesn't exist.
3	ATM file can't be empty	The ATM file path cannot be empty.
4	If the BD address does not exist, burning cannot be canceled.	If there is no BD Address inside the EVK, then the user is required to program a BD Address.
5	BD address format error, please check again	The BD Address format is xx:xx:xx:xx:xx:xx. If the format is incorrect, writing will not be possible.
6	Chip information does not match. Should we proceed with the burning process?	The EVK and the chip version information of the ATM file to be flashed must be consistent.
7	Authentication information can't be empty	If the 'Enable secure debug' checkbox is selected, the Authentication information cannot be empty.
8	Failed to generate J-Link file	Unable to generate the J-Link script file required for J-Link scripting.
9	The partition layout of the .atm file is inconsistent with the device. Do you want to continue?	When NVDS dump fails, prompt the user to decide whether to skip the NVDS check. (Bare Metal SDK only)
10	At least one file needs to be selected for programming	At least one checkbox for the ATM file must be selected.
11	ATM file does not include a partition map file, please use another atm file	The 'Partition_info.map' does not exist in the ATM file. Please use a different ATM file for flashing.
12	Unable to find corresponding J-Link Device settings	Board information is not found in the ATM file.
13	Failed to copy the J-Link script	Failed to copy the J-Link script file in the jlink/ide_prj_gen directory.

Index	Error message	Troubleshoot
14	Please install the J-Link to your system	Not installed J-Link driver.
15	J-Link version can't be lower than v7.80	Please upgrade Jlink to version 7.80 or higher.
16	The selected Auth COM port cannot establish a connection	The COM port used for authentication does not exist.
17	Unknown Chip platform	Corresponding Chip Platform not found.
18	J-Link path <J-Link Segger Path> does not exist, please install J-Link to your system	J-Link Segger installation directory not found. Please download and install it from the J-Link website.
20	The checksum of the current key file is inconsistent with that of the ATM	The key's checksum doesn’t match the information in the ATM file
21	There is no checksum information in the ATM file	The ATM file doesn’t contain checksum information for verification
22	The ATM file does not support secure debug	The ATM file doesn’t support secure debug.
23	Key checksum information is not present in the ATM file	The ATM file doesn’t support secure debug.
24	Export path can't be empty	The export log path cannot be empty.
25	The address and size can't be empty	Address and Size parameters cannot be empty.
26	The current address range is not allowed for this device	Address range not permitted.
27	No dump region found	Dump parameters not found.
28	Dump via J-Link is not supported for chips other than ATM2/ATM3	ATM33/ATM34 can only dump RRAM/Flash using OpenOCD, while J-Link OB can only dump RRAM.
29	The dump path can't be empty	The dump bin file path cannot be empty.

Table 9-1 Error Message Description

Reference Documents

Tool	Description	Link
J-Link	Software and Documentation pack	https://www.segger.com/downloads/jlink

Revision History

Date	Version	Description
April 1, 2026	0.54	Updated with Flash Programming Tool Release 1.0.0.34
Dec 8, 2025	0.53	Updated with Flash Programming Tool Release 1.0.0.33
Aug 15, 2025	0.52	Updated with Flash Programming Tool Release 1.0.0.32
January 17, 2025	0.51	Updated with Flash Programming Tool Release 1.0.0.30
August 31, 2023	0.50	Initial version created.

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