

S32K1XX CSEC TOOL

Quick start guide

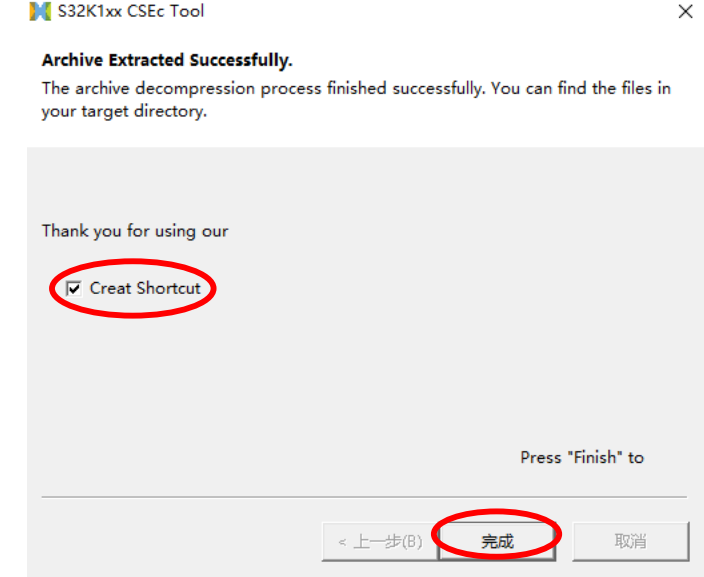
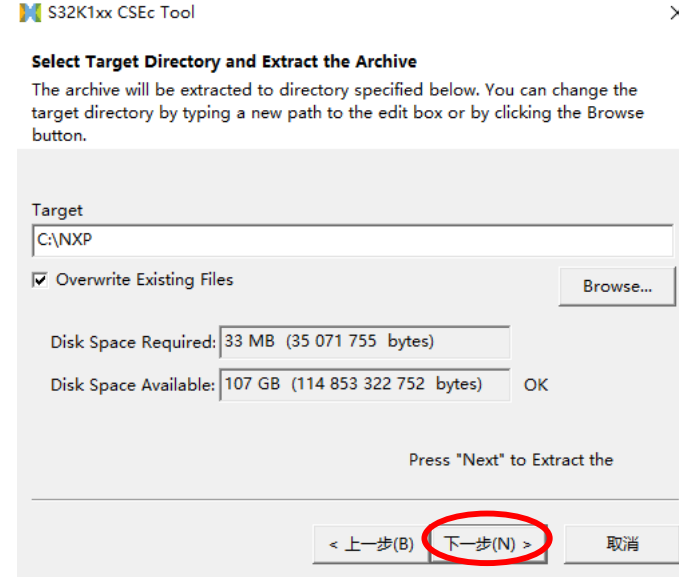
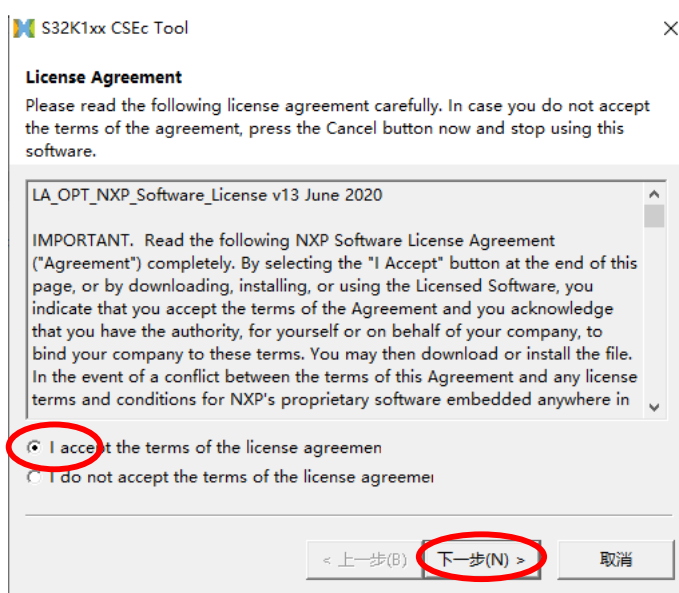


SECURE CONNECTIONS
FOR A SMARTER WORLD

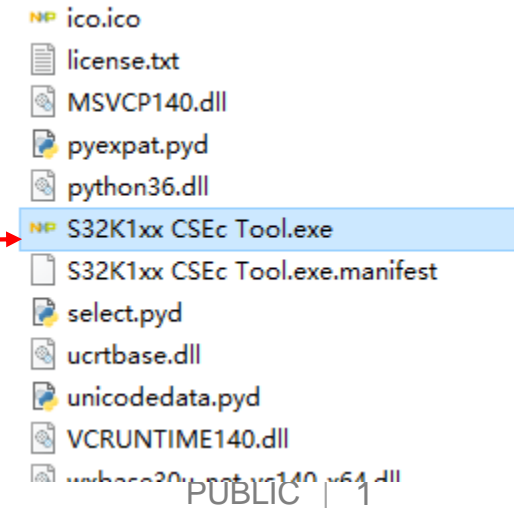
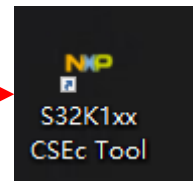
PUBLIC



1 Install software



Double click the shortcut on desktop.
Or find the S32K1xx CSEc Tool.exe in software install folder to run it



2 CSEc configuration

The screenshot displays the S32K1xx CSEC Tool interface, which is divided into three main sections: CSEC Init, AES Tool, and Calculate M.

CSEC Init (Left Panel):

- Key Selection: S32K144F512 (dropdown)
- Secure Boot Options: ☒ CSEC, ☐ Secure Boot
- Boot Mode: Sequential Boot Mode (dropdown)
- Byte Boot Size: 16384 (input)
- Flash/EEPROM: 0KB DFlash:64KB EFlas (dropdown), 4KB EEPROM (dropdown)
- Keys: 24 Keys (dropdown)
- Auto load: ☒ Auto load, ☒ USFE
- Buttons: Config Keys, Create Initial Firmware, Create Partition Code, Create Reset Firmware

AES Tool (Middle Panel):

- Input: 000102030405060708090A0B0C0D0E0F (32/32)
- Key: 000102030405060708090A0B0C0D0E0F (32/32)
- IV: 00000000000000000000000000000000 (32/32)
- Buttons: Load Bin File, ECB (dropdown), Crypto (dropdown), Compute

Calculate M (Right Panel):

- AuthKey: FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF (32/32)
- NewKey: 000102030405060708090A0B0C0D0E0F (32/32)
- Options: ☐ WRITE_PROT, ☐ BOOT_PROT, ☐ DEBUG_PROT, ☐ KEY_USAGE, ☐ WILD_CARD, ☐ VERIFY_ONLY
- UID: 00000000000000000000000000000000 (30/30)
- AuthKeyID: MASTER_ECU_KEY (dropdown), Counter: 1 (input)
- NewKeyID: MASTER_ECU_KEY (dropdown), Calculate (button)

2.1 Configure CSEc area

The screenshot displays the 'S32K1xx CSEC Tool' interface. The 'CSEC Init' section is highlighted with a yellow border. Various configuration options are visible, including chip selection, secure boot enablement, boot mode, and key management. Annotations in purple boxes with arrows point to specific UI elements, while blue boxes on the right indicate the sequence of steps.

Annotations:

- Chose chip
- Enable/Disable CSEc Secure boot
- Chose Secure boot mode and size
- DE-Flash partition
- Click to show key configuration panel
- Create initial and reset CSEc FW
- Create partition code
- Output information

Steps:

- Step 1
- Step 2
- Step 3

2.2 CSEc keys configuration panel

The screenshot displays the 'NXP Config Keys' window. It features a list of keys including 'Master ECU Key', 'User Key 01', 'User Key 04', 'User Key 07', 'User Key 10', 'User Key 13', 'User Key 16', 'User Key 17', 'User Key 08', 'User Key 09', 'User Key 12', and 'User Key 15'. Each key entry includes a text field for the key value, a status indicator (e.g., '32/32' or '0/32'), and a set of checkboxes for 'Enable', 'WRITE_PROT', 'BOOT_PROT', 'DEBUG_PROT', 'KEY_USAGE', 'WILD_CARD', and 'VERIFY_ONLY'. A blue box highlights the 'Master ECU Key' section. A purple callout bubble points to the 'Enable' checkbox of the 'Master ECU Key' with the text 'Configure CSEc keys, include key value, attributions.' Another purple callout bubble points to the 'Import Key' button at the bottom right with the text 'Click and import keys for next step create firmware'.

Master ECU Key 000102030405060708090A0B0C0D0E0F 32/32

☒ Enable ☐ WRITE_PROT ☐ BOOT_PROT ☐ DEBUG_PROT
☐ KEY_USAGE ☐ WILD_CARD ☐ VERIFY_ONLY

User Key 01 0/32

☐ Enable ☐ WRITE_PROT ☐ BOOT_PROT ☐ DEBUG_PROT
☐ KEY_USAGE ☐ WILD_CARD ☐ VERIFY_ONLY

User Key 04 0/32

☐ Enable ☐ WRITE_PROT ☐ BOOT_PROT ☐ DEBUG_PROT
☐ KEY_USAGE ☐ WILD_CARD ☐ VERIFY_ONLY

User Key 07 0/32

☐ Enable ☐ WRITE_PROT ☐ BOOT_PROT ☐ DEBUG_PROT
☐ KEY_USAGE ☐ WILD_CARD ☐ VERIFY_ONLY

User Key 10 0/32

☐ Enable ☐ WRITE_PROT ☐ BOOT_PROT ☐ DEBUG_PROT
☐ KEY_USAGE ☐ WILD_CARD ☐ VERIFY_ONLY

User Key 13 0/32

☐ Enable ☐ WRITE_PROT ☐ BOOT_PROT ☐ DEBUG_PROT
☐ KEY_USAGE ☐ WILD_CARD ☐ VERIFY_ONLY

User Key 16 0/32

☐ Enable ☐ WRITE_PROT ☐ BOOT_PROT ☐ DEBUG_PROT
☐ KEY_USAGE ☐ WILD_CARD ☐ VERIFY_ONLY

User Key 17 0/32

☐ Enable ☐ WRITE_PROT ☐ BOOT_PROT ☐ DEBUG_PROT
☐ KEY_USAGE ☐ WILD_CARD ☐ VERIFY_ONLY

User Key 08 0/32

☐ Enable ☐ WRITE_PROT ☐ BOOT_PROT ☐ DEBUG_PROT
☐ KEY_USAGE ☐ WILD_CARD ☐ VERIFY_ONLY

User Key 09 0/32

☐ Enable ☐ WRITE_PROT ☐ BOOT_PROT ☐ DEBUG_PROT
☐ KEY_USAGE ☐ WILD_CARD ☐ VERIFY_ONLY

User Key 12 0/32

☐ Enable ☐ WRITE_PROT ☐ BOOT_PROT ☐ DEBUG_PROT
☐ KEY_USAGE ☐ WILD_CARD ☐ VERIFY_ONLY

User Key 15 0/32

☐ Enable ☐ WRITE_PROT ☐ BOOT_PROT ☐ DEBUG_PROT
☐ KEY_USAGE ☐ WILD_CARD ☐ VERIFY_ONLY

Import Key

3 AES tool

The image shows a software interface for the S32K1xx CSEC Tool, divided into three main sections: CSEC Init, AES Tool, and Calculate M. The AES Tool section is highlighted with a blue border.

CSEC Init

- S32K144F512 (dropdown)
- ☒ CSEC ☐ Secure Boot
- Sequential Boot Mode (dropdown)
- 16384 (text input) Byte Boot Size
- 0KB DFlash:64KB EFlas (dropdown)
- 4KB EEPROM (dropdown)
- 24 Keys (dropdown)
- ☒ Auto load ☒ USFE
- Config Keys (button)
- Create Initial Firmware (button)
- Create Partition Code (button)
- Create Reset Firmware (button)

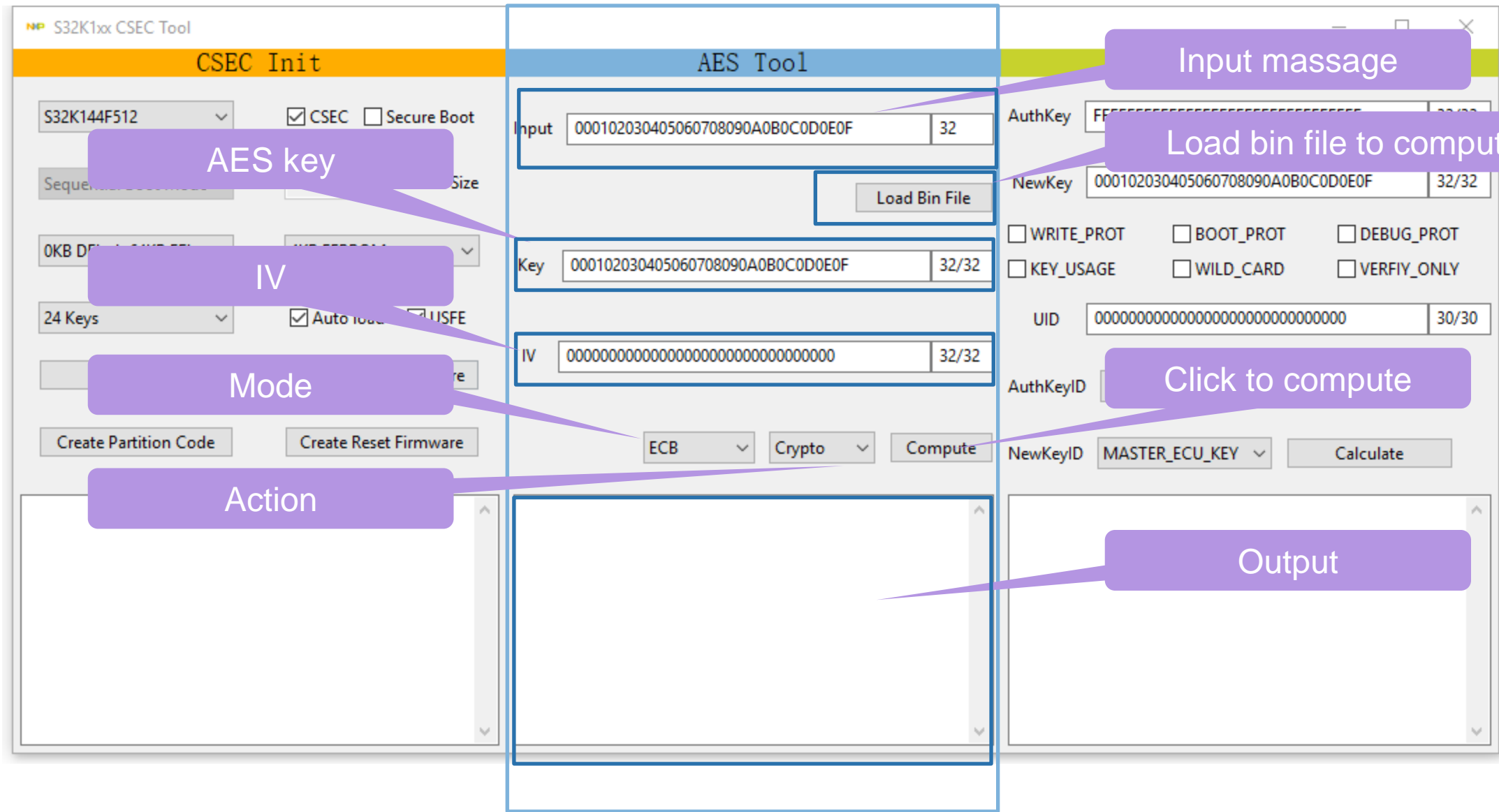
AES Tool

- Input: 000102030405060708090A0B0C0D0E0F (32)
- Load Bin File (button)
- Key: 000102030405060708090A0B0C0D0E0F (32/32)
- IV: 00000000000000000000000000000000 (32/32)
- ECB (dropdown) Crypto (dropdown) Compute (button)

Calculate M

- AuthKey: FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF (32/32)
- NewKey: 000102030405060708090A0B0C0D0E0F (32/32)
- ☐ WRITE_PROT ☐ BOOT_PROT ☐ DEBUG_PROT
- ☐ KEY_USAGE ☐ WILD_CARD ☐ VERIFY_ONLY
- UID: 00000000000000000000000000000000 (30/30)
- AuthKeyID: MASTER_ECU_KEY (dropdown) Counter: 1 (text input)
- NewKeyID: MASTER_ECU_KEY (dropdown) Calculate (button)

3.1 AES tool area



4 Calculate M1~M5

The image shows the S32K1xx CSEC Tool interface with the 'Calculate M' window open. The main window has two tabs: 'CSEC Init' (orange) and 'AES Tool' (blue). The 'Calculate M' window (yellow border) contains the following fields and controls:

- AuthKey:** A text box containing 'FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF' with a '32/32' label.
- NewKey:** A text box containing '000102030405060708090A0B0C0D0E0F' with a '32/32' label.
- Checkboxes:** ☐ WRITE_PROT, ☐ BOOT_PROT, ☐ DEBUG_PROT, ☐ KEY_USAGE, ☐ WILD_CARD, ☐ VERIFY_ONLY.
- UID:** A text box containing '00000000000000000000000000000000' with a '30/30' label.
- AuthKeyID:** A dropdown menu showing 'MASTER_ECU_KEY'.
- Counter:** A text box containing '1'.
- NewKeyID:** A dropdown menu showing 'MASTER_ECU_KEY'.
- Calculate:** A button to perform the calculation.

The main window also shows various configuration options under the 'CSEC Init' tab, including 'S32K144F512', 'CSEC' (checked), 'Secure Boot' (unchecked), 'Sequential Boot Mode', '16384' Byte Boot Size, '0KB DFlash:64KB EFlas', '4KB EEPROM', '24 Keys', 'Auto load' (checked), 'USFE' (checked), and buttons for 'Config Keys', 'Create Initial Firmware', 'Create Partition Code', and 'Create Reset Firmware'. The 'AES Tool' tab shows 'Input', 'Key', 'IV', 'ECB', 'Crypto', and 'Compute' options.

4.1 Calculate M1~M5

The image shows the S32K1xx CSEC Tool interface, divided into two main sections: CSEC Init and AES Tool. The AES Tool section is further divided into a configuration area and a 'Calculate M' sub-window. The 'Calculate M' sub-window is highlighted with a yellow border and contains the following fields and controls:

- AuthKey:** A text field containing 'FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF' with a '32/32' character count indicator.
- NewKey:** A text field containing '000102030405060708090A0B0C0D0E0F' with a '32/32' character count indicator.
- WRITE_PROT, BOOT_PROT, DEBUG_PROT, KEY_USAGE, WILD_CARD, VERIFY_ONLY:** A row of six checkboxes, all currently unchecked.
- UID:** A text field containing '00000000000000000000000000000000' with a '30/30' character count indicator.
- AuthKeyID:** A dropdown menu set to 'MASTER_ECU_KEY'.
- Counter:** A text field containing '1'.
- NewKeyID:** A dropdown menu set to 'MASTER_ECU_KEY'.
- Calculate:** A button to initiate the calculation.
- Output:** A large text area at the bottom for displaying results.

Annotations with purple callouts point to the following elements in the AES Tool section:

- Authorization key:** Points to the 'AuthKey' field in the 'Calculate M' sub-window.
- New key:** Points to the 'NewKey' field in the 'Calculate M' sub-window.
- New key attributions:** Points to the row of checkboxes in the 'Calculate M' sub-window.
- UID:** Points to the 'UID' field in the 'Calculate M' sub-window.
- Keys ID:** Points to the 'AuthKeyID' and 'NewKeyID' dropdown menus in the 'Calculate M' sub-window.
- Keys update counter:** Points to the 'Counter' field in the 'Calculate M' sub-window.
- Click to compute:** Points to the 'Calculate' button in the 'Calculate M' sub-window.
- Output:** Points to the large text area at the bottom of the 'Calculate M' sub-window.