



# MT793X IoT SDK for DES User Guide

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## Version History

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Version	Date	Description
1.0	2021-07-29	Official release

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## 1 Getting Started

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This chapter introduces the DES (Data Encryption Standard) feature and gives you an idea of what you need to prepare to get started.

### 1.1 Overview

Support DES CBC (Cipher Block Chaining) and ECB (Electronic Codebook).

### 1.2 Code Layout

```
driver\chip\mt7933\src\hal_des.c  
driver\chip\inc\hal_des.h  
driver\chip\mt7933\inc\hal_gcpu_internal.h
```

### 1.3 DES APIs

```
hal_des_cbc_decrypt  
hal_des_cbc_encrypt  
hal_des_ecb_decrypt  
hal_des_ecb_encrypt
```

## 2 DES Sample Use Cases

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Use DES in the CBC mode to perform encryption and decryption. \n

- Step 1. Call #hal\_des\_cbc\_encrypt() to encrypt.
- Step 2. Call #hal\_des\_cbc\_decrypt() to decrypt.

Sample code:

```
*  uint8_t des_cbc_iv[HAL_DES_CBC_IV_LENGTH] = {
*      0x61, 0x33, 0x46, 0x68, 0x55, 0x38, 0x31, 0x43
*  };
*  uint8_t encrypted[32] = {0};
*  uint8_t plain[30] = {
*      0, 11, 22, 33, 44, 55, 66, 77, 88, 99, 0, 11, 22, 33, 44, 55, 66,
*      77, 88, 99, 0, 11, 22, 33, 44, 55, 66, 77, 88, 99
*  };
*  hal_des_buffer_t plain_text = {
*      .buffer = plain,
*      .length = sizeof(plain)
*  };
*  hal_des_buffer_t key = {
*      .buffer = hardware_id,
*      .length = sizeof(hardware_id)
*  };
*  hal_des_buffer_t encrypted_text = {
*      .buffer = encrypted,
*      .length = sizeof(encrypted)
*  };
*  hal_des_cbc_encrypt(&encrypted_text, &plain_text, &key, des_cbc_iv);
*
*  uint8_t decrypted_buffer[32] = {0};
*  hal_aes_buffer_t decrypted_text = {
*      .buffer = decrypted_buffer,
*      .length = sizeof(decrypted_buffer)
*  };
*  hal_des_cbc_decrypt(&decrypted_text, &encrypted_text, &key, des_cbc_iv);
*
```

Use DES in the ECB mode to perform encryption and decryption. \n

- Step 1. call #hal\_des\_ecb\_encrypt() to encrypt.
- Step 2. call #hal\_des\_ecb\_decrypt() to decrypt.

Sample code:

```
*  uint8_t hardware_id[8] = {
*      0x4d, 0x54, 0x4b, 0x30, 0x30, 0x30, 0x30, 0x30
*
```

```
*  
*   };  
*   uint8_t plain[] = {  
*       0, 11, 22, 33, 44, 55, 66, 77, 88, 99, 0, 11, 22, 33, 44, 55,  
*       66, 77, 88, 99, 0, 11, 22, 33, 44, 55, 66, 77, 88, 99  
*   };  
*   hal_des_buffer_t plain_text = {  
*       .buffer = plain,  
*       .length = sizeof(plain)  
*   };  
*   hal_des_buffer_t key = {  
*       .buffer = hardware_id,  
*       .length = sizeof(hardware_id)  
*   };  
*   uint8_t encrypted_buffer[32] = {0};  
*   hal_des_buffer_t encrypted_text = {  
*       .buffer = encrypted_buffer,  
*       .length = sizeof(encrypted_buffer)  
*   };  
*   hal_des_ecb_encrypt(&encrypted_text, &plain_text, &key);  
*  
*   uint8_t decrypted_buffer[32] = {0};  
*   hal_des_buffer_t decrypted_text = {  
*       .buffer = decrypted_buffer,  
*       .length = sizeof(decrypted_buffer)  
*   };  
*   hal_des_ecb_decrypt(&decrypted_text, &encrypted_text, &key);
```

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