

# How to use SWD password in CCS

MSP Team

timx\_timer\_mode\_periodic\_sleep.c empty.c MSPM0L1306.cxml x dl\_sysctl\_mspm0l11xx\_l13xx.h 0x23a

### Target Configuration

**All Connections**

- Texas Instruments XDS110 USB Debug Probe
  - MSPM0L1306**
    - CS\_DAP\_0
      - subpath\_0
        - CORTEX\_M0P
      - subpath\_1
        - SEC\_AP

Import...  
New...  
Add...  
Delete  
Up  
Down  
Test Connection  
Save

**Device Properties**  
ARM Cortex-M0 Plus MCU

Set the properties of the selected device.

MSPM0 SWD Password [0] (32-bit HEX format)	0x00000001
MSPM0 SWD Password [1] (32-bit HEX format)	0xFFFFFFFF
MSPM0 SWD Password [2] (32-bit HEX format)	0xFFFFFFFF
MSPM0 SWD Password [3] (32-bit HEX format)	0xFFFFFFFF

Basic **Advanced** Source

workspace\_v12\_3 - timx\_timer\_mode\_periodic\_sleep\_LP\_MSPM0L1306\_nortos\_ticlang/timx\_timer\_mode\_periodic\_sleep.c - Code Composer Studio

File Edit View Navigate Project Run Scripts Window Help

- Resource Explorer
- Project Explorer
- E2E-Getting Started
- emp-CCS App Center
- spl-GUI Composer™
- timx
  - Project Explorer
  - Problems Alt+Shift+Q, X
  - Console Alt+Shift+Q, C
  - Advice
  - Debug
    - Memory Browser
    - Registers
    - Expressions
    - Variables Alt+Shift+Q, V
    - Disassembly
    - Breakpoints Alt+Shift+Q, B
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    - Terminal
    - Scripting Console
    - Target Configurations Alt+Shift+Q, O
    - Outline
    - Stack Usage
    - Memory Allocation
    - Optimizer Assistant
    - Other... Alt+Shift+Q, Q

```
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31 */
32
33 #include "ti_msp_d1_config.h"
34
35 int main(void)
36 {
37     SYSCFG_DL_init();
38
39     NVIC_EnableIRQ(TIMER_0_INST_IRQN);
40     DL_SYSCCTL_enableSleepOnExit();
41
42     DL_TimerG_startCounter(TIMER_0_INST);
43
44     while (1) {
45         __WFI();
46     }
47 }
48
49 void TIMER_0_INST_IRQHandler(void)
50 {
51     switch (DL_TimerG_getPendingInterrupt(TIMER_0_INST)) {
52         case DL_TIMER_IIDX_ZERO:
53             DL_GPIO_togglePins(GPIO_LEDS_PORT, GPIO_LEDS_USER_LED_1_PIN);
54             break;
55         default:
56             break;
57     }
58 }
```

Target Configurations

- type filter text
- Projects
  - E2E-TEST
  - empty\_LP\_MSPM0L1306\_nortos\_ticlang
  - spl\_peripheral\_multibyte\_fifo\_poll\_LP\_MSPM0L1306
  - timx\_timer\_mode\_periodic\_sleep\_LP\_MSPM0L1306
    - targetConfigs
      - MSPM0L1306.ccm1
      - User Defined

Click the New button to create a new target configuration file. Click [here](#) to hide this message.

Console x MSPM0L1306.ccm1

Description	Resource	Path
0 Items		

Writable Smart Insert 37 : 1 : 1663



workspace\_v12\_3 - timx\_timer\_mode\_periodic\_sleep\_LP\_MSPM0L1306\_nortos\_ticlang/timx\_timer\_mode\_periodic\_sleep.c - Code Composer Studio

File Edit View Project Tools Run Scripts Window Help

MSPM0L1306.Commands

- MSPM0\_MailboxMassErase\_Manual
- MSPM0\_MailboxMassErase\_Auto
- MSPM0\_Mailbox\_FactoryReset\_Manual
- MSPM0\_Mailbox\_FactoryReset\_Auto
- MSPM0\_Mailbox\_PasswordAuthentication\_Auto

Debug

- MSPM0L1306.ccm1 [Code Composer Studio - Device Debugging]
- Texas Instruments XDS110 USB Debug Probe/CORTEX\_M0P (Discon...

Identity	Name	Condition	Count	Action
<input type="checkbox"/>	timx_timer_mode_periodic_sleep.c line 51 (DL_Timer.g...	---	---	---

```

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31 */
32
33#include "ti_msp_d1_config.h"
34
35int main(void)
36{
37    SYSCFG_DL_init();
38
39    NVIC_EnableIRQ(TIMER_0_INST_IRQN);
40    DL_SYSTCL_enableSleepOnExit();
41
42    DL_TimerG_startCounter(TIMER_0_INST);
43
44    while (1) {
45        __WFI();
46    }
47 }

```

Disassembly

Console

```

CDT Build Console [timx_timer_mode_periodic_sleep_LP_MSPM0L1306_nortos_ticlang]

**** Build of configuration Debug for project timx_timer_mode_periodic_sleep_LP_MSPM0L1306_nortos_ticlang ****

"C:\ti\ccs1230\ccs\utils\bin\gmake" -k -j 8 all -o

gmake[1]: 'timx_timer_mode_periodic_sleep_LP_MSPM0L1306_nortos_ticlang.out' is up to date.
gmake[1]: Nothing to be done for 'secondary-outputs'.

**** Build Finished ****

```

Writable Smart Insert 37 : 1 : 1663

workspace\_v12\_3 - Source not found. - Code Composer Studio

File Edit View Project Tools Run Scripts Window Help

Debug ×

- Load Program... Ctrl+Alt+L
- Reload Program Ctrl+Alt+R
- Load Symbols...
- Add Symbols...
- Verify Program...
- Remove All Symbols
- C:\Users\workspace\_v12\_3\...\Debug\timx\_timer\_mode\_periodic\_sleep\_LP\_MSPM1306\_nortos\_ticlag.out
- C:\Users\workspace\_v12\_3\...\Debug\empty\_LP\_MSPM1306\_nortos\_ticlag.out
- C:\Users\workspace\_v12\_3\...\Debug\timx\_timer\_mode\_periodic\_sleep\_LP\_MSPM1306\_nortos\_ticlag.out
- C:\Users\workspace\_v12\_3\...\Debug\empty\_LP\_MSPM1306\_nortos\_ticlag.out
- C:\Users\workspace\_v12\_3\...\Debug\spi\_peripheral\_multibyte\_fifo\_poll\_LP\_MSPM1306\_nortos\_ticlag.out
- C:\Users\workspace\_v12\_3\...\Debug\spi\_peripheral\_multibyte\_fifo\_poll\_LP\_MSPM1306\_nortos\_ticlag.out

timx\_timer\_mode\_periodic\_sleep.c

Break at address "0x14a" with no debug information available, or outside of program code.

View Disassembly...

Configure when this editor is shown Preferences...

Disassembly ×

Address	Hex	Instruction	Comment
*0000014a	Bf30	wfi	
0000014c	E7FD	b	#0x14a
0000014e	45C0	mov	r8, r8
00000150	E100	b	#0x354
00000152	E000	b	#0x156
00000154	ED10E000	ldc	p0, c14, [r0, #-0]
00000158	5804	ldr	r4, [r0, r0]
0000015a	4008	ands	r0, r1
0000015c	8500	push	{r7, r14}
0000015e	4806	ldr	r0, [pc, #0x18]
00000160	4906	ldr	r1, [pc, #0x18]
00000162	6041	str	r1, [r0, #4]
00000164	4A06	ldr	r2, [pc, #0x18]
00000166	6051	str	r1, [r2, #4]
00000168	4906	ldr	r1, [pc, #0x18]
0000016a	6001	str	r1, [r0]
0000016c	6011	str	r1, [r2]
0000016e	2010	movs	r0, #0x10
00000170	F900F85E	b1	#0x230
00000174	8D00	pop	{r7, pc}
00000176	46C0	mov	r8, r8
00000178	0800	lsrcs	r0, r0, #0x20
0000017a	400A	ands	r2, r1
0000017c	0003	movs	r3, r0
0000017e	E100	cbz	r0, #0x182
00000180	4800	ldr	r0, [pc, #0]
00000182	4008	ands	r0, r1
00000184	0001	movs	r1, r0
00000186	2600	movs	r6, #0
00000188	4806	ldr	r0, [pc, #0x18]
0000018a	6301	ldr	r1, [r0]
0000018c	2203	movs	r2, #3
.....	...		

Console ×

MSPM1306.ccm1

```

CS_DAP_0: GEL Output: SEC_AP Disconnect
CS_DAP_0: GEL Output: SEC_AP Reconnect
CS_DAP_0: GEL Output: Send Data...
CS_DAP_0: GEL Output: Data 1 Sent = 0x00000001
CS_DAP_0: GEL Output: Data 2 Sent = 0xFFFFFFFF
CS_DAP_0: GEL Output: Data 3 Sent = 0xFFFFFFFF
CS_DAP_0: GEL Output: Data 4 Sent = 0xFFFFFFFF
CS_DAP_0: GEL Output: Command execution completed.
CORTEX_M0P: GEL Output: Password Authentication executed.
CORTEX_M0P: GEL Output: Memory Map Initialization Complete

```



Debug x

MSPM0L1306.cxml [Code Composer Studio - Device Debugging]

- Texas Instruments XDS110 USB Debug Probe/CORTEX\_M0P (Suspended - HW Breakpoint)
  - main() at timx\_timer\_mode\_periodic\_sleep.c:37 0x000012C
  - \_c\_int00\_template() at boot\_cortex\_m.c0 0x00001C0
  - \_c\_int00\_noinit\_noargs() at boot\_cortex\_m.c98 0x00001AC

Identity	Name	Condition	Count	Action
<input type="checkbox"/>	timx_timer_mode_periodic_sleep.c line 51 (DL_Timer_g) Breakpoint		0 (0)	Remain Halted

timx\_timer\_mode\_periodic\_sleep.c @ empty.c MSPM0L1306.cxml dl\_sysctl\_mspm0l11xx\_l13xx.h 0x23a

```

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29 * OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE,
30 * EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
31 */
32
33#include "ti_msp_dl_config.h"
34
35int main(void)
36{
37    SYSCFG_DL_init();
38
39    NVIC_EnableIRQ(TIMER_0_INST_IRQN);
40    DL_SYSCTL_enableSleepOnExit();
41
42    DL_TimerG_startCounter(TIMER_0_INST);
43
44    while (1) {
45        __WFI();
46    }
47
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```

Console x

MSPM0L1306.cxml

```

CS_DAP_0: GEL Output: SEC_AP Disconnect
CS_DAP_0: GEL Output: SEC_AP Reconnect
CS_DAP_0: GEL Output: Send Data...
CS_DAP_0: GEL Output: Data 1 Sent = 0x00000001
CS_DAP_0: GEL Output: Data 2 Sent = 0xFFFFFFFF
CS_DAP_0: GEL Output: Data 3 Sent = 0xFFFFFFFF
CS_DAP_0: GEL Output: Data 4 Sent = 0xFFFFFFFF
CS_DAP_0: GEL Output: Command execution completed.
CORTEX_M0P: GEL Output: Password Authentication executed.
CORTEX_M0P: GEL Output: Memory Map Initialization Complete

```

Disassembly x

main():

```

0000012c: F00F876 b1 SYSCFG_DL_init
745      __COMPILER_BARRIER();
      __NVIC_EnableIRQ():
00000130: 2001      movs    r0, #1
00000132: 0401      lsls   r1, r0, #0x10
00000134: 4A06      ldr    r2, [pc, #0x18]
746      NVIC->ISER[0U] = (uint32_t)(1UL << (((uint32_t)IRQn) & 0xF
00000136: 6011      str    r1, [r2]
747      __COMPILER_BARRIER();
00000138: 4906      ldr    r1, [pc, #0x18]
598      SCB->SCR |= SCB_SCR_SLEEPONEXIT_Msk;
DL_SYSCTL_enableSleepOnExit():
0000013a: 680A      ldr    r2, [r1]
0000013c: 2302      movs    r3, #2
0000013e: 4313      orrs   r3, r2
00000140: 6008      str    r3, [r1]
00000142: 4905      ldr    r1, [pc, #0x14]
3232      gptimer->COUNTERREGS_CTL |= (GPTIMER_CTL_EN_ENABLED);
DL_TimerG_startCounter():
00000144: 680A      ldr    r2, [r1]
00000146: 4302      orrs   r2, r0
00000148: 600A      str    r2, [r1]
45      __WFI();
0000014a: BF30      wfi
44      while (1) {
0000014c: E7F0      b      #0x14a
0000014e: 46C0      mov    r8, r8
00000150: E100      b      #0x354
00000152: E000      b      #0x156
00000154: ED10E000 ldc    p0, c14, [r0, #-0]
00000158: 5804      ldr    r4, [r0, r0]
-----

```

## Other tips

- When you successfully access device with SWD password, then if **you do not reset device or re-power on**, the device will keep connected and you can do any SWD operations (like CCS load/debug, UniFlash connection) without password.
- The reason is that **only in the boot code, does the M0 device need check SWD password**, after successfully password check, then there will be no more password demand.

Useful link: [https://software-dl.ti.com/msp430/esd/MSPM0-SDK/1\\_00\\_00\\_04/docs/english/tools/ccs\\_ide\\_guide/doc\\_guide/doc\\_guide-srcs/ccs\\_ide\\_guide.html#dssm-swd-password-mechanism](https://software-dl.ti.com/msp430/esd/MSPM0-SDK/1_00_00_04/docs/english/tools/ccs_ide_guide/doc_guide/doc_guide-srcs/ccs_ide_guide.html#dssm-swd-password-mechanism)

# Standalone XDS110 SWD Password Procedure

**MSP Team**

# Summary

When using SWD password function via standalone XDS110, there is unknown issue about Reset.

- Add a MSPM0\_Mailbox\_PasswordAuthentication\_Manual function to .gel file, so you can press Reset button manually.

# Step 1: Open Target Configuration

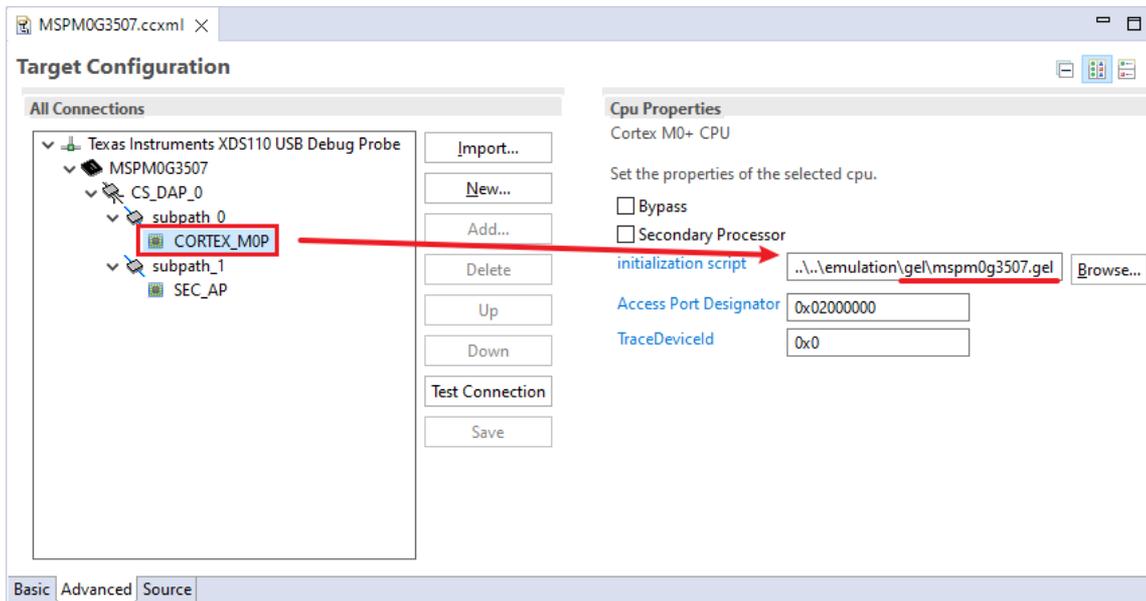
1. Open .ccxml file of your project.
2. Click Target Configuration.

The screenshot displays the Code Composer Studio interface. In the Project Explorer on the left, the 'targetConfigs' folder is expanded, and the 'MSPM0G3507.ccxml [Active]' file is selected. A red box highlights this file, with a red arrow pointing to the 'Target Configuration' section of the main dialog. The dialog shows the 'Connection' set to 'Texas Instruments XDS110 USB Debug Probe' and the 'Board or Device' list with 'MSPM0G3507' selected. A red box highlights the 'Target Configuration' link in the top right of the dialog, with a red arrow pointing to it. The console at the bottom shows the output: 'Unknown\_uart\_standby0\_LowPowerCurrent\_G3507\_nortos\_ticlang' and 'CORTEX\_M0P: GEL Output: Memory Map Initialization Complete'. The right sidebar shows project statistics for 'Project 'timx\_timer\_mode\_pwm\_edge\_sleep\_LP\_MSPM0G3507': FLASH (864 (0%)), SRAM (512 (1%)), BCR\_CONFIG, and BSL\_CONFIG.

# Step 2: Check .gel file name and open it

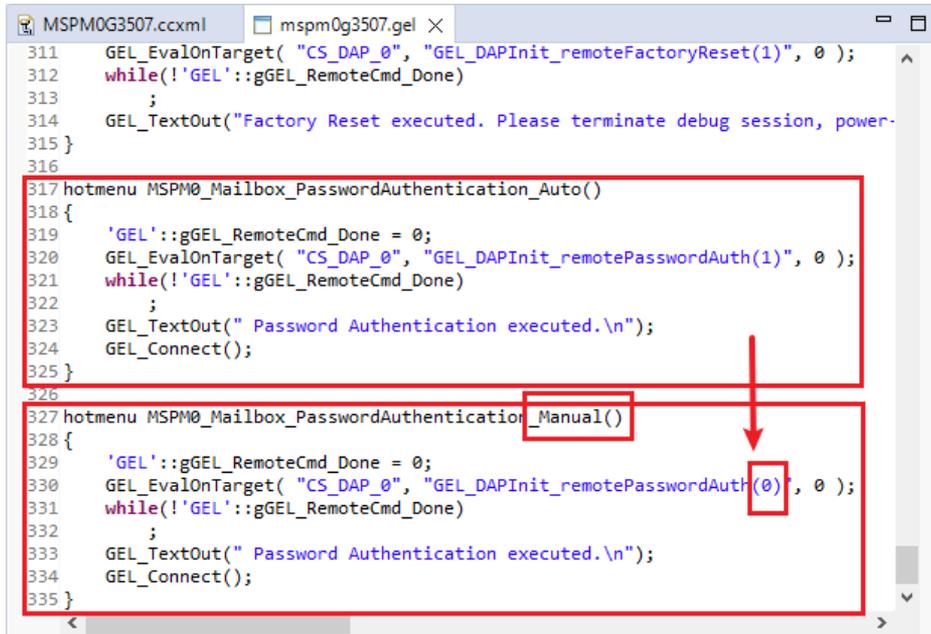
path to .gel file: C:\ti\ccs1250\ccs\ccs\_base\emulation\gel

1. Open CORTEX\_M0P
2. Remember you .gel file's file name.
3. Open and Edit .gel file via file path.



# Step 3: Edit .gel file

1. Open .gel file
2. Copy and paste a new Password function.
3. Change the name to Manual and (1) to (0).



```
311 GEL_EvalOnTarget( "CS_DAP_0", "GEL_DAPInit_remoteFactoryReset(1)", 0 );
312 while(!'GEL'::gGEL_RemoteCmd_Done)
313 ;
314 GEL_TextOut("Factory Reset executed. Please terminate debug session, power-
315 }
316
317 hotmenu MSPM0_Mailbox_PasswordAuthentication_Auto()
318 {
319 'GEL'::gGEL_RemoteCmd_Done = 0;
320 GEL_EvalOnTarget( "CS_DAP_0", "GEL_DAPInit_remotePasswordAuth(1)", 0 );
321 while(!'GEL'::gGEL_RemoteCmd_Done)
322 ;
323 GEL_TextOut(" Password Authentication executed.\n");
324 GEL_Connect();
325 }
326
327 hotmenu MSPM0_Mailbox_PasswordAuthentication_Manual()
328 {
329 'GEL'::gGEL_RemoteCmd_Done = 0;
330 GEL_EvalOnTarget( "CS_DAP_0", "GEL_DAPInit_remotePasswordAuth(0)", 0 );
331 while(!'GEL'::gGEL_RemoteCmd_Done)
332 ;
333 GEL_TextOut(" Password Authentication executed.\n");
334 GEL_Connect();
335 }
```

# Step 4: Retry the Password Authentication Manual

1. Retry your Project's Password Authentication procedure
2. Using MSPM0\_Mailbox\_PasswordAuthentication\_Manual
3. During the procedure, need to press RESET button once.

