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Ford Phase5 CDC 烧录指导文档

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介绍

目的

本文档依据 CDC 产品架构提供 SOC 和 MCU 烧录方式。SOC 升级支持：QFile 和 U 盘方式；MCU 升级支持：DET 方式。

后续 SOC 还将支持 OTA 升级，MCU 还将支持 OTA 升级，功能 OK 时同步更新此文档。

SOC 烧录(QFile 升级)

用途

SA8155P 平台提供的强制刷机方式，可用于常规的软件版本刷写或因其他方式升级失败时强制恢复系统。

刷机软件安装(Window 系统)

相关软件包请参考 Phase5 tool package 压缩文件，下载路径：https://github.ford.com/China-IVI/China-CDC/tree/master/04_Release/phase5 tool package/.

或见文档目录安装包(安装包\QFile)。

用于初始化机器，需要在 windows 环境上安装。

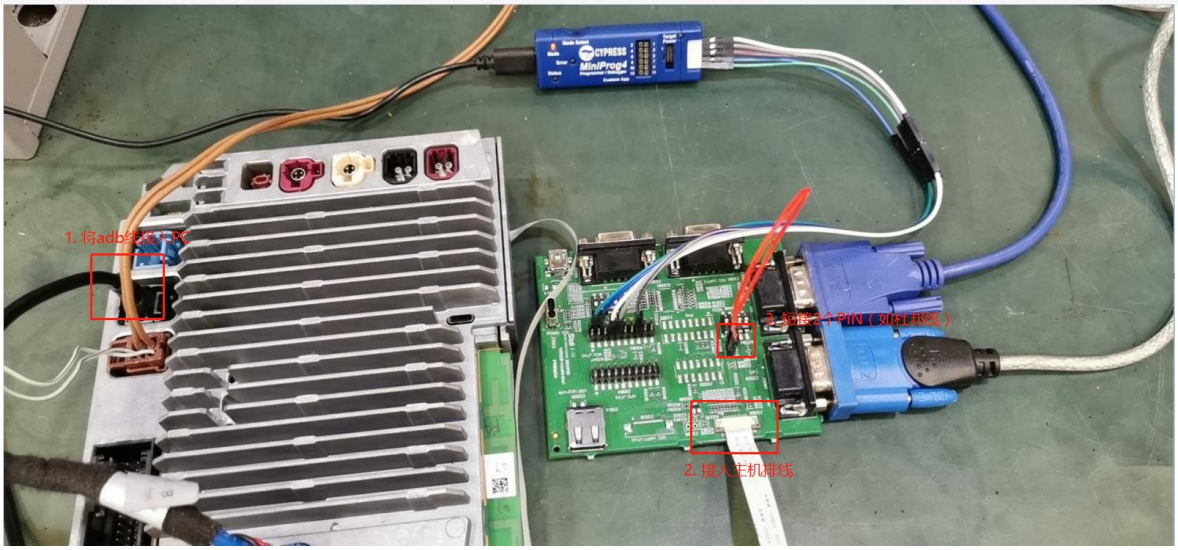
1) qpst.win.2.7_installer_00496.2(QFILE 软件，路径：phase5 tool package\QFile installer software)
2) qud.win.1.1_installer_10049.36(QFILE 驱动，路径：phase5 tool package\QFile driver)

刷机步骤

■ **接线示意图**

可参考下图硬件接线，保证下述 3 点即可：

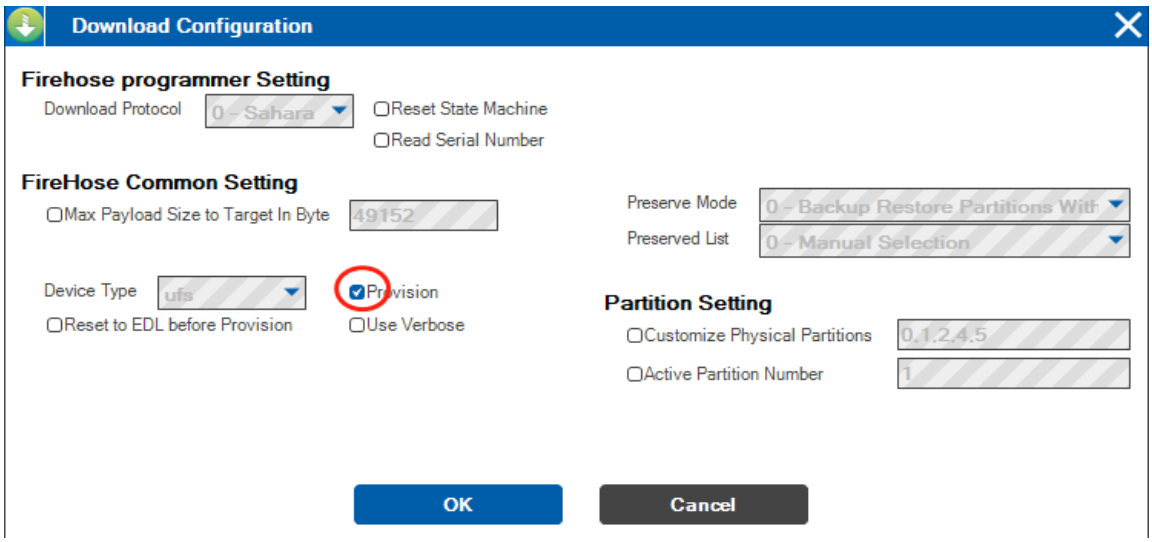
- 主机 adb 线接入 PC
- 主机白色排线接入 Debug 板
- 短接 Debug 板上 2 个 PIN 进入 download 模式（可使用杜邦线短接）



■ 初始化机器

需要在 Windows 环境下完成，**只需要执行一次即可**，如果已完成初始化则跳转到整包烧录步骤(**出厂后的机器则调过此步骤**)。

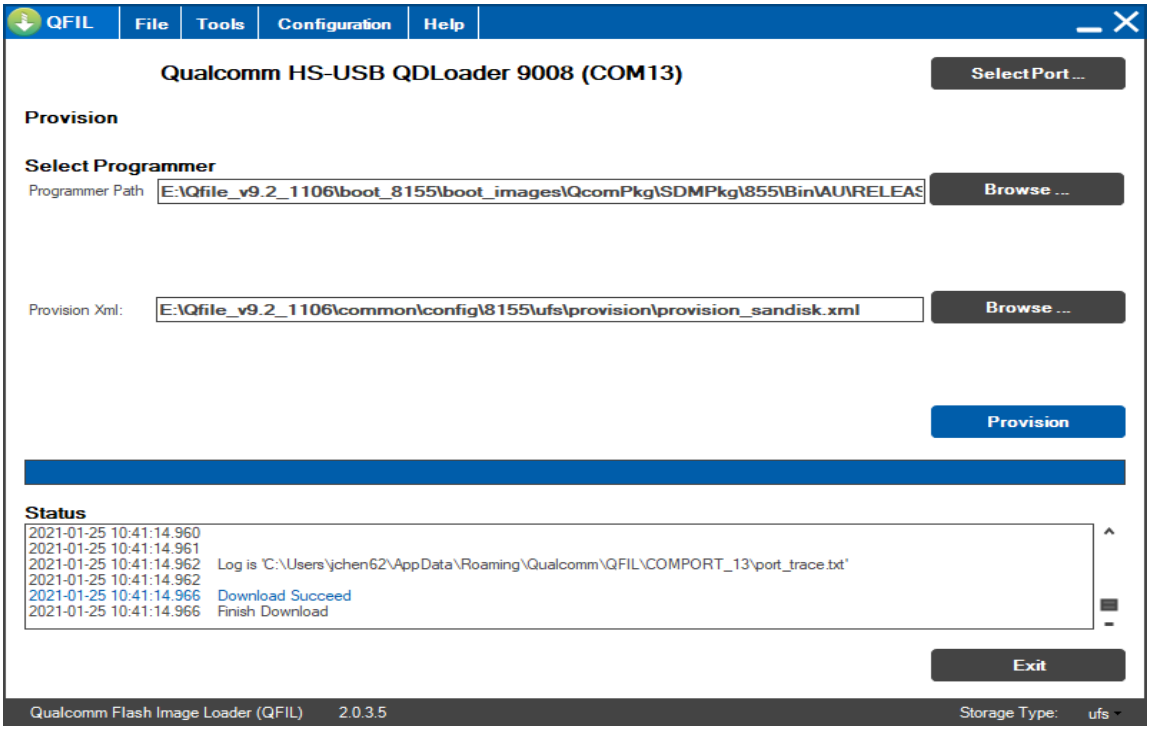
1. 打开 QFILE.exe 工具，点击 Configuration->FireHoseConfiguration 出现下图，点击红圈处，然后点击 OK。



2. 出现如下界面，按住选择下面两个文件，然后点击 Provision，等待完成。

1) boot_8155\boot_images\QcomPkg\SDMPkg\855\Bin\AU\RELEASE\prog_firehose_ddr.elf

2) common\config\8155\ufs\provision\provision_sandisk.xml



■ 整包烧录

1. 下载 Qfile 压缩包，解压到 Windows 的磁盘里（不可以有中文目录）。

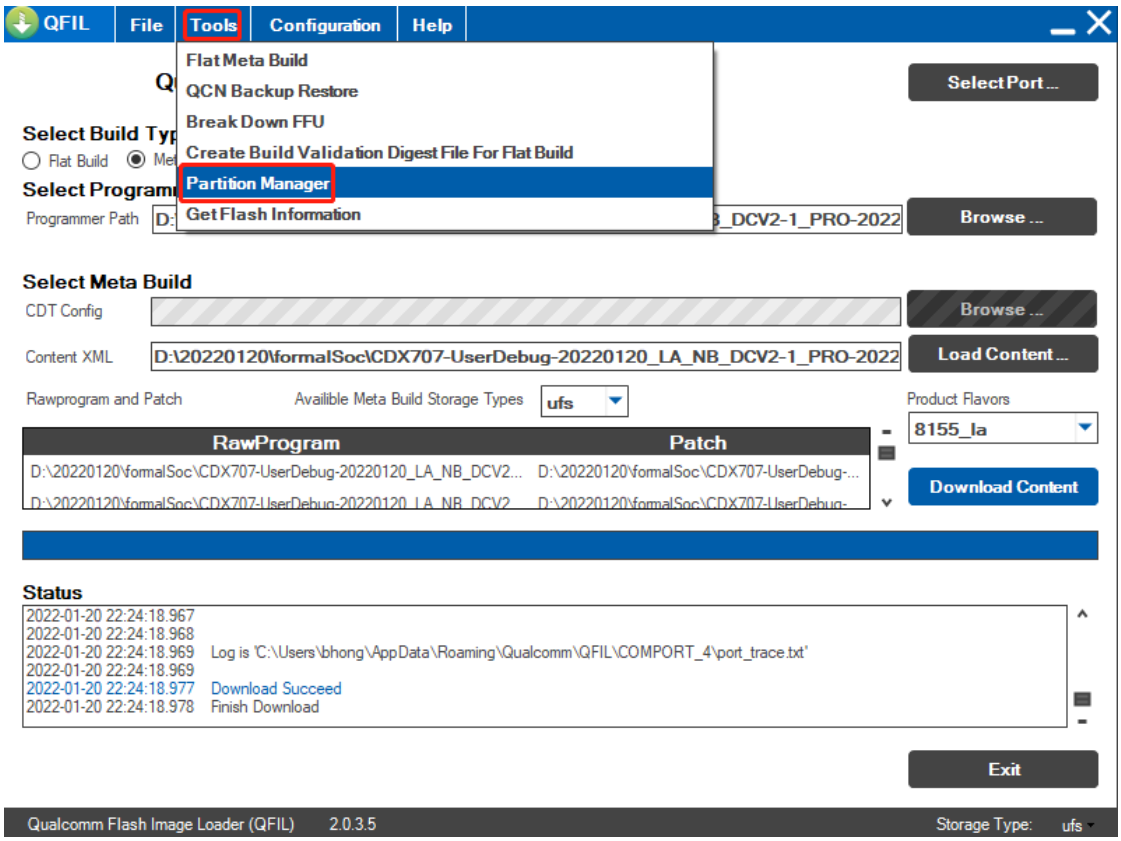
Jforg 路径：http://136.18.248.78:8082/ui/native/CDC-Ford-phase5-29662/Formal-Release/SOC/XXX

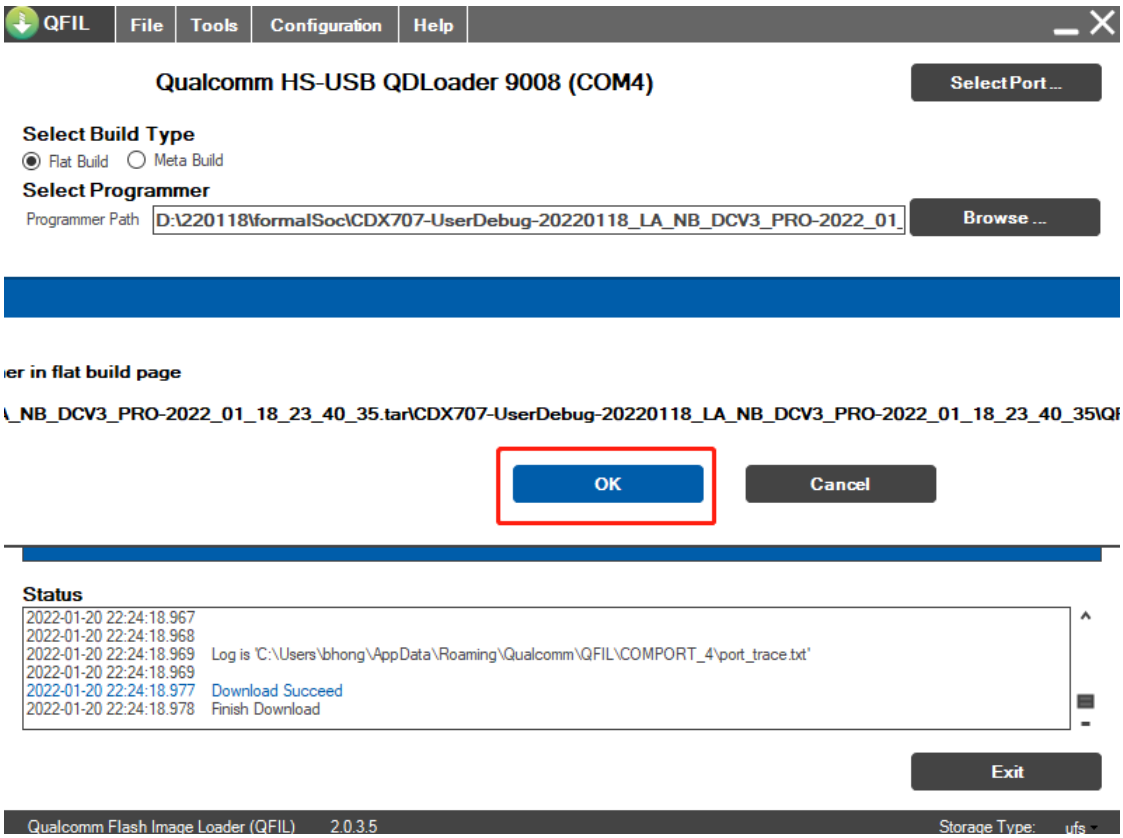
目录 XXX 后期会通过邮件发布。

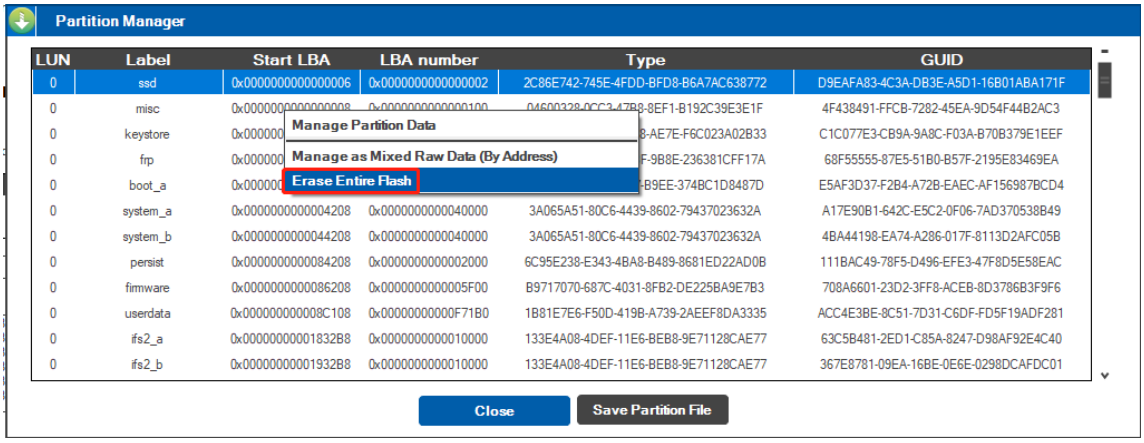
升级压缩包格式参考：CDX707-UserDebug-FORD_PHASE5_CDX707_DCV_2-20211228_LA_NB_DCV2_PRO-2021_12_28_21_27_16.tar.gz

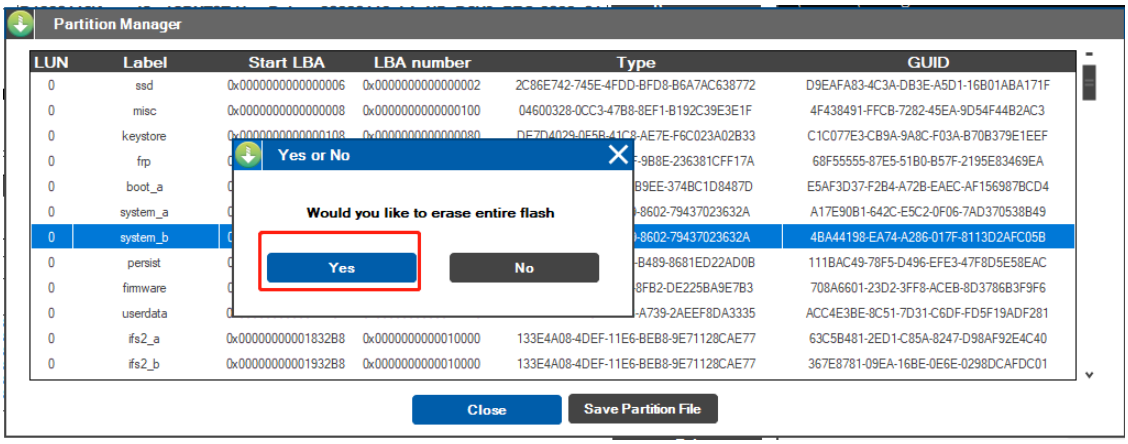
2. 进入 Download 模式：Debug 板短接跳线(可参考上图硬件接线)，然后上电。

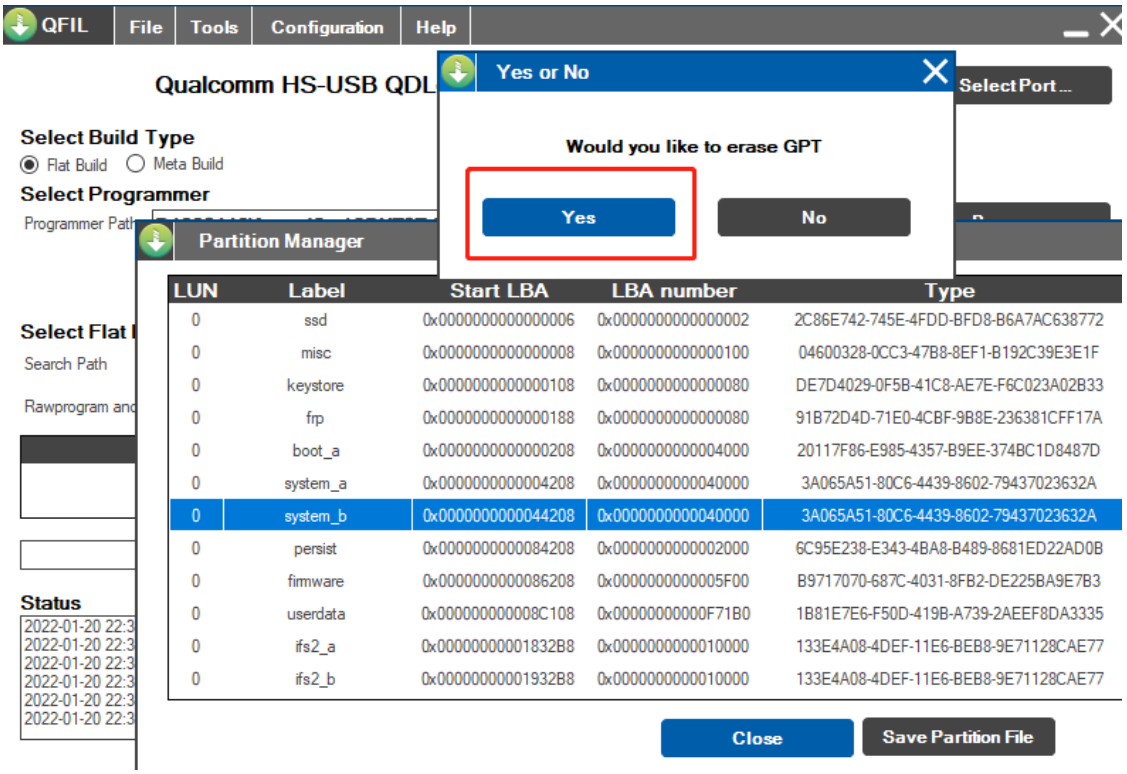
3. 清空分区（当发生分区调整时可执行）

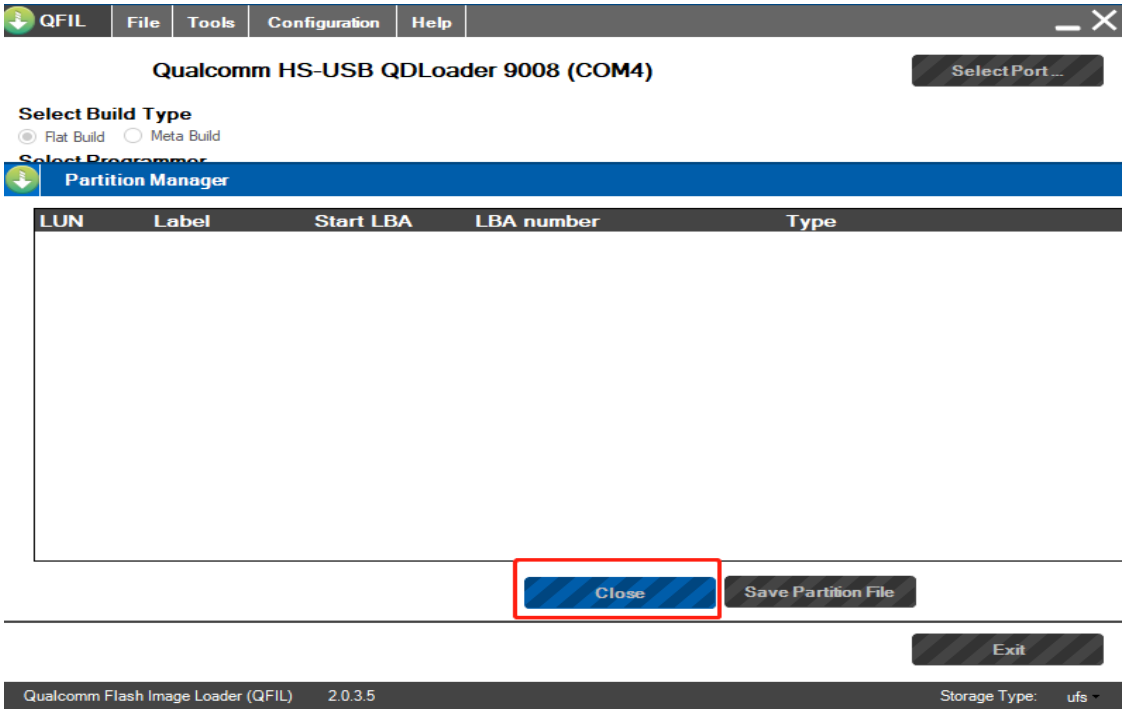


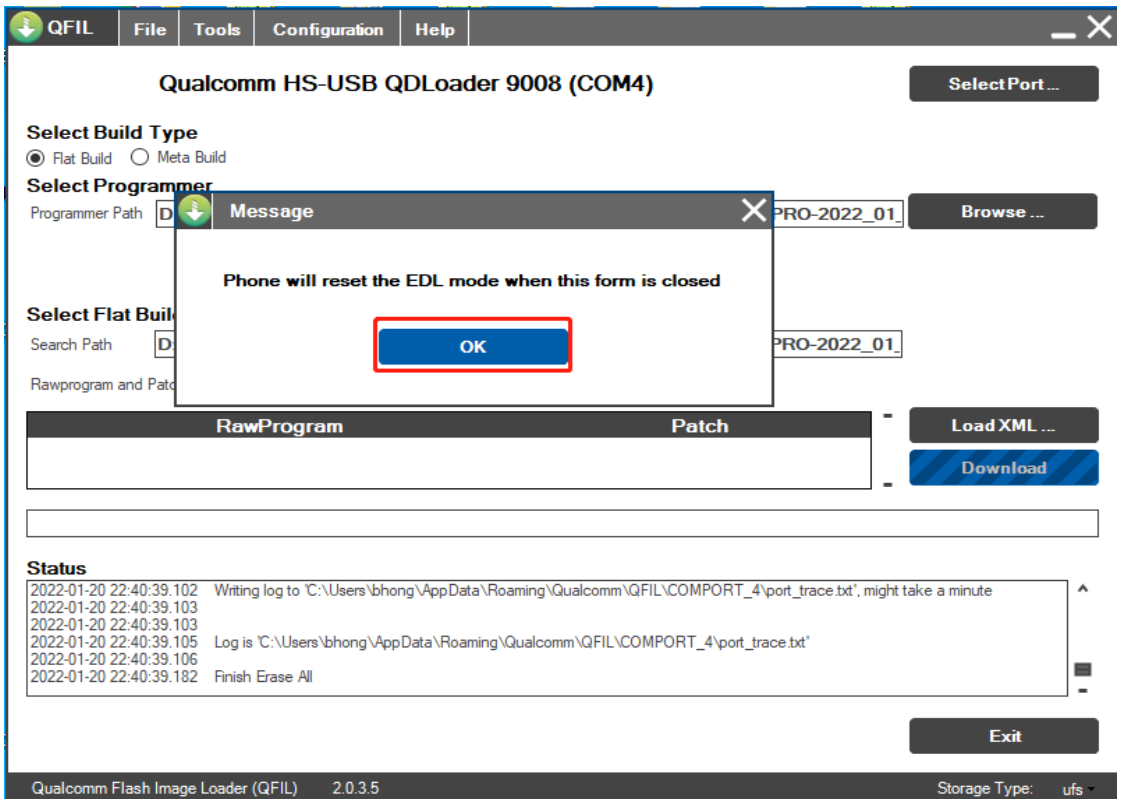



Partition Manager
LUN Label Start LBA LBA number Type GUID
0 ssd 0x0000000000000006 0x0000000000000002 2C86E742-745E-4FDD-BFD8-B6A7AC638772 D9EAFA83-4C3A-DB3E-A5D1-16B01ABA171F
0 misc 0x0000000000000008 0x0000000000000100 04600328-0CC3-47B8-8EF1-B192C39E3E1F 4F438491-FFCB-7282-45EA-9D54F44B2AC3
0 keystore 0x0000000 -AE7E-F6C023A02B33 C1C077E3-CB9A-9A8C-F03A-B70B379E1EEF
0 frp 0x0000000 -9B8E-236381CFF17A 68F55555-87E5-51B0-B57F-2195E83469EA
0 boot_a 0x0000000 -B9EE-374BC1D8487D E5AF3D37-F2B4-A72B-EAEC-AF156987BCD4
0 system_a 0x0000000000004208 0x0000000000040000 3A065A51-80C6-4439-8602-79437023632A A17E90B1-642C-E5C2-0F06-7AD370538B49
0 system_b 0x0000000000044208 0x0000000000040000 3A065A51-80C6-4439-8602-79437023632A 4BA44198-EA74-A286-017F-8113D2AFC05B
0 persist 0x0000000000084208 0x0000000000002000 6C95E238-E343-4BA8-B489-8681ED22AD0B 111BAC49-78F5-D496-EFE3-47F8D5E58EAC
0 firmware 0x0000000000086208 0x000000000005F00 B9717070-687C-4031-8FB2-DE225BA9E7B3 708A6601-23D2-3FF8-ACEB-8D3786B3F9F6
0 userdata 0x000000000008C108 0x00000000000F71B0 1B81E7E6-F50D-419B-A739-2AEEF8DA3335 ACC4E3BE-8C51-7D31-C6DF-FD5F19ADF281
0 ifs2_a 0x00000000001832B8 0x0000000000010000 133E4A08-4DEF-11E6-BEB8-9E71128CAE77 63C5B481-2ED1-C85A-8247-D98AF92E4C40
0 ifs2_b 0x00000000001932B8 0x0000000000010000 133E4A08-4DEF-11E6-BEB8-9E71128CAE77 367E8781-09EA-16BE-0E6E-0298DCAFDC01
Manage Partition Data
Manage as Mixed Raw Data (By Address)
Erase Entire Flash
Close
Save Partition File


Partition Manager
LUN Label Start LBA LBA number Type GUID
0 ssd 0x0000000000000006 0x0000000000000002 2C86E742-745E-4FDD-BFD8-B6A7AC638772 D9EAFA83-4C3A-DB3E-A5D1-16B01ABA171F
0 misc 0x0000000000000008 0x0000000000000100 04600328-0CC3-47B8-8EF1-B192C39E3E1F 4F438491-FFCB-7282-45EA-9D54F44B2AC3
0 keystore C1C077E3-CB9A-9A8C-F03A-B70B379E1EEF
0 frp -9B8E-236381CFF17A 68F55555-87E5-51B0-B57F-2195E83469EA
0 boot_a B9EE-374BC1D8487D E5AF3D37-F2B4-A72B-EAEC-AF156987BCD4
0 system_a -8602-79437023632A A17E90B1-642C-E5C2-0F06-7AD370538B49
0 system_b -8602-79437023632A 4BA44198-EA74-A286-017F-8113D2AFC05B
0 persist -B489-8681ED22AD0B 111BAC49-78F5-D496-EFE3-47F8D5E58EAC
0 firmware 8FB2-DE225BA9E7B3 708A6601-23D2-3FF8-ACEB-8D3786B3F9F6
0 userdata -A739-2AEEF8DA3335 ACC4E3BE-8C51-7D31-C6DF-FD5F19ADF281
0 ifs2_a 0x00000000001832B8 0x0000000000010000 133E4A08-4DEF-11E6-BEB8-9E71128CAE77 63C5B481-2ED1-C85A-8247-D98AF92E4C40
0 ifs2_b 0x00000000001932B8 0x0000000000010000 133E4A08-4DEF-11E6-BEB8-9E71128CAE77 367E8781-09EA-16BE-0E6E-0298DCAFDC01
Yes or No
Would you like to erase entire flash
Yes
No
Close
Save Partition File


QFIL
File
Tools
Configuration
Help
Qualcomm HS-USB QDL
Select Port ...
Select Build Type
Flat Build
Meta Build
Select Programmer
Programmer Path
Select Flat
Search Path
Rawprogram and
Status
2022-01-20 22:3
Yes or No
Would you like to erase GPT
Yes
No
Partition Manager
LUN Label Start LBA LBA number Type
0 ssd 0x0000000000000006 0x0000000000000002 2C86E742-745E-4FDD-BFD8-B6A7AC638772
0 misc 0x0000000000000008 0x0000000000000100 04600328-0CC3-47B8-8EF1-B192C39E3E1F
0 keystore 0x0000000000000108 0x0000000000000080 DE7D4029-0F5B-41C8-AE7E-F6C023A02B33
0 frp 0x0000000000000188 0x0000000000000080 91B72D4D-71E0-4CBF-9B8E-236381CFF17A
0 boot_a 0x0000000000000208 0x0000000000004000 20117F86-E985-4357-B9EE-374BC1D8487D
0 system_a 0x0000000000004208 0x0000000000040000 3A065A51-80C6-4439-8602-79437023632A
0 system_b 0x0000000000044208 0x0000000000040000 3A065A51-80C6-4439-8602-79437023632A
0 persist 0x0000000000084208 0x0000000000002000 6C95E238-E343-4BA8-B489-8681ED22AD0B
0 firmware 0x0000000000086208 0x000000000005F00 B9717070-687C-4031-8FB2-DE225BA9E7B3
0 userdata 0x000000000008C108 0x00000000000F71B0 1B81E7E6-F50D-419B-A739-2AEEF8DA3335
0 ifs2_a 0x00000000001832B8 0x0000000000010000 133E4A08-4DEF-11E6-BEB8-9E71128CAE77
0 ifs2_b 0x00000000001932B8 0x0000000000010000 133E4A08-4DEF-11E6-BEB8-9E71128CAE77
Close
Save Partition File

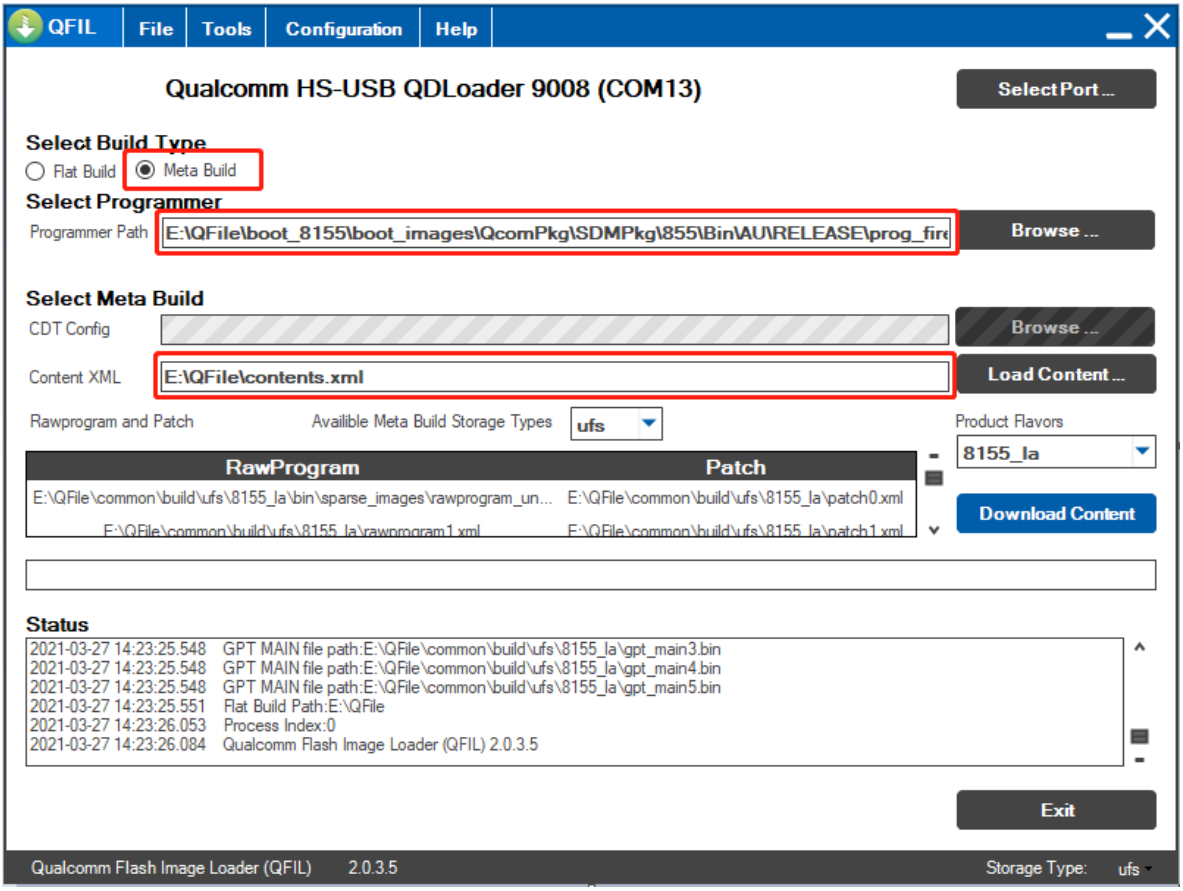




4. 烧录时首先 Load Content，选择下面的两个文件，点击 Download Content 等待下载完成。

   1) boot_8155\boot_images\QcomPkg\SDMPkg\855\Bin\AU\RELEASE\prog_firehose_ddr.elf

   2) contents.xml



SOC 烧录(USB 升级)

1. 下载升级压缩包，解压到 U 盘根目录。

Jforg 路径：http://136.18.248.78:8082/ui/native/CDC-Ford-phase5-29662/Formal-Release/SOC/XXX

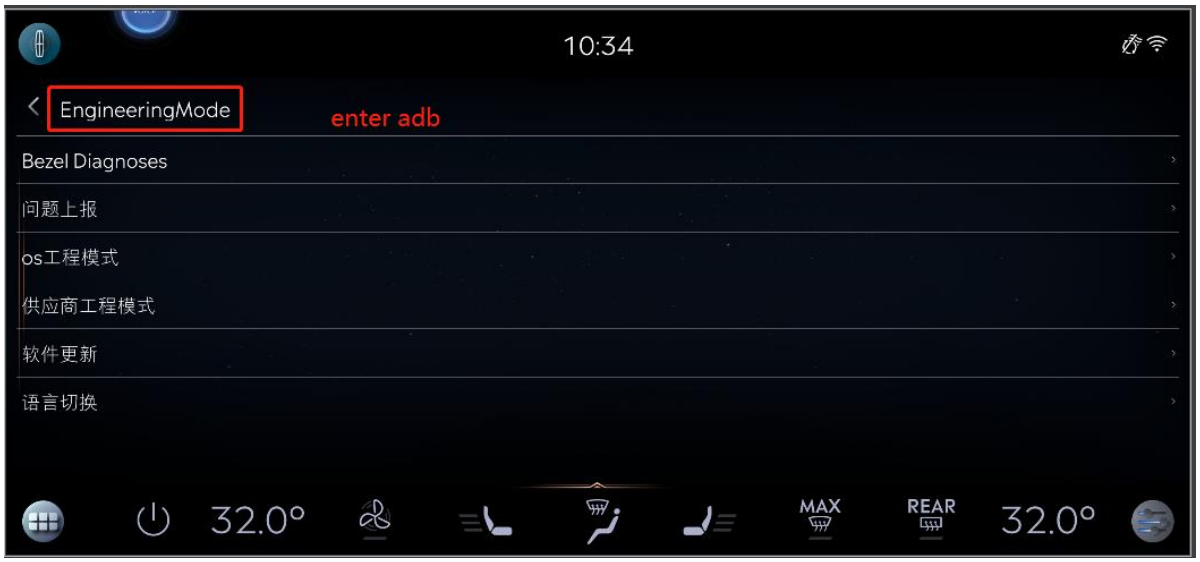
目录 XXX 后期会通过邮件发布。

升级压缩包格式参考： update.tar

2. 进入工程模式

系统设置->常规设置->关于-> 软件版本号（**连续点击 7 次**）进入工程模式

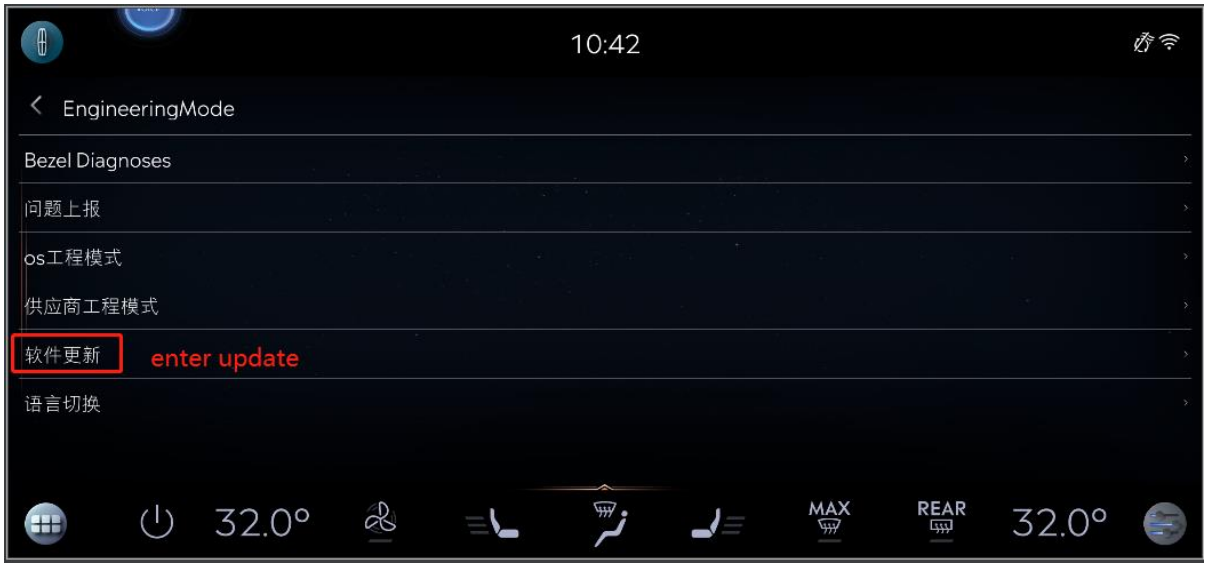
3. 点击《EngineeringMode》进入 adb 模式关闭 adb，切为 U 盘模式。


10:34
EngineeringMode
enter adb
Bezel Diagnoses
问题上报
os工程模式
供应商工程模式
软件更新
语言切换
32.0°
MAX
REAR
32.0°

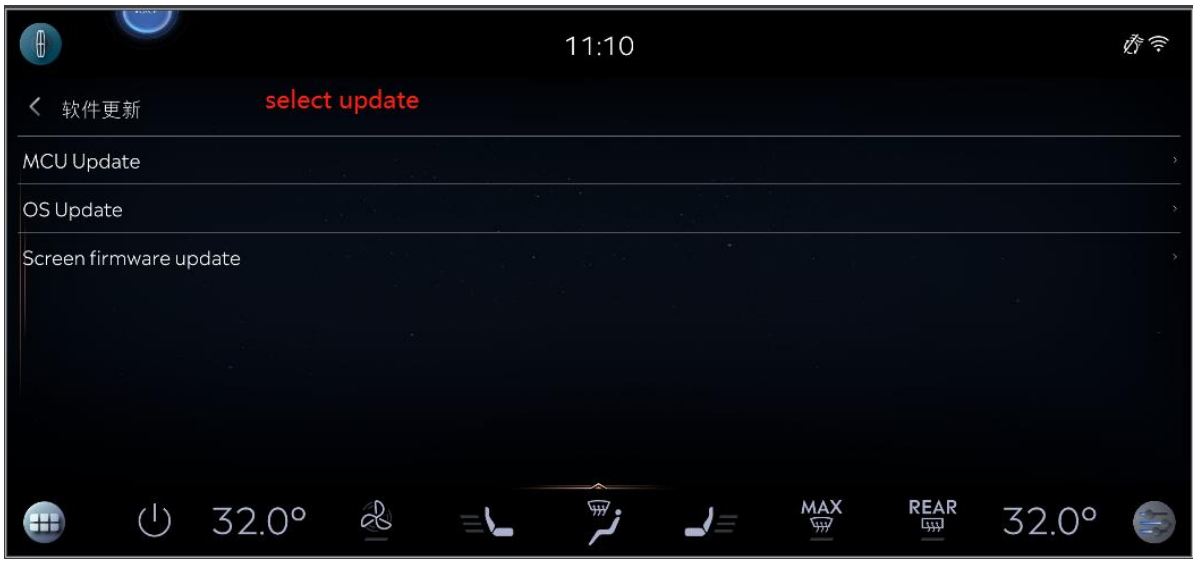

10:35
EngineeringMode
adb模式
close adb
32.0°
MAX
REAR
32.0°


10:39
EngineeringMode
Bezel Diagnoses
问题上报
os工程模式
供应商工程模式
软件更新
语言切换
insert USB
发现可用USB设备
32.0°
MAX
REAR
32.0°

4. 点击《软件更新》



5. 点击《OS Update》升级

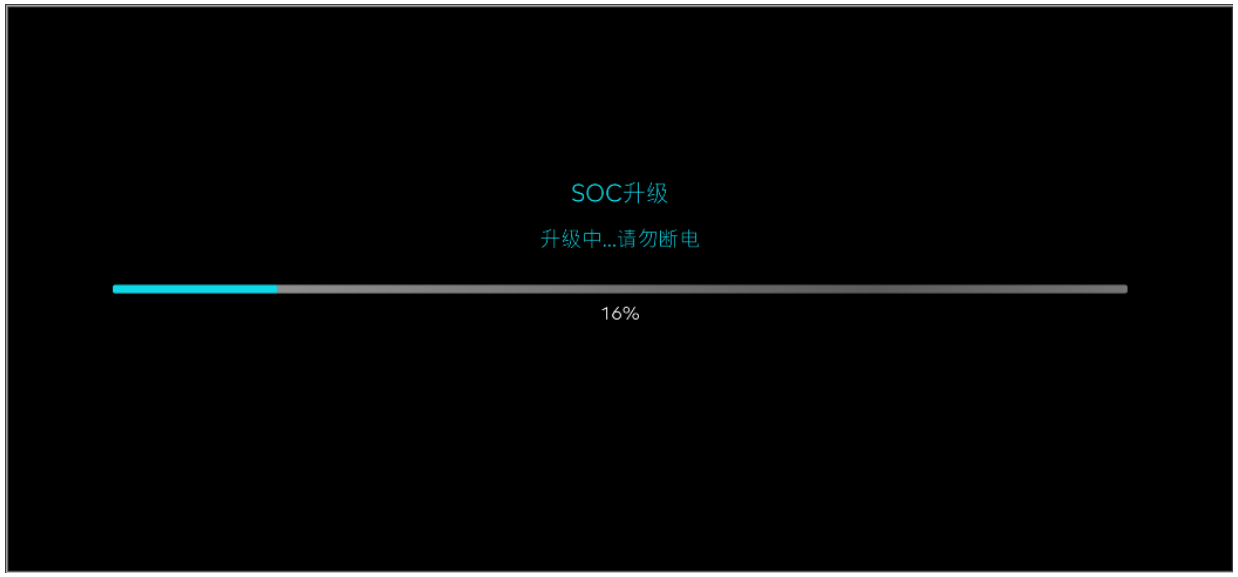


6. 升级界面过程如下

注意：若偶现升级中系统重启界面点击确认按键后未完成重启，可通过长按 ICP 的 Power 键 10S 强制重启系统以完成本次升级。


SOC升级
升级文件拷贝中...请勿插拔u盘
1%


SOC升级
升级文件解压中...


SOC升级
升级中...请勿断电
16%

MCU DET 烧录

烧录工具

硬件：

CYT2BL 的 Flash 使用 SWD 接口方式烧写，对应的硬件工具为 5-Pin 的 Cypress MiniProg4。

软件：

Cypress MiniProg4 配套使用软件：AutoFlashUtil。相应的安装版本为 AutoFlashUtil_1.2.0_b1732.exe.

安装文件已通过 Github 更新发布,地址：

https://github.ford.com/China-IVI/China-CDC/tree/master/04_Release/phase5 tool package/MCU installer software/AutoFlashUtil_1.2.0_b1732.exe

硬件接线

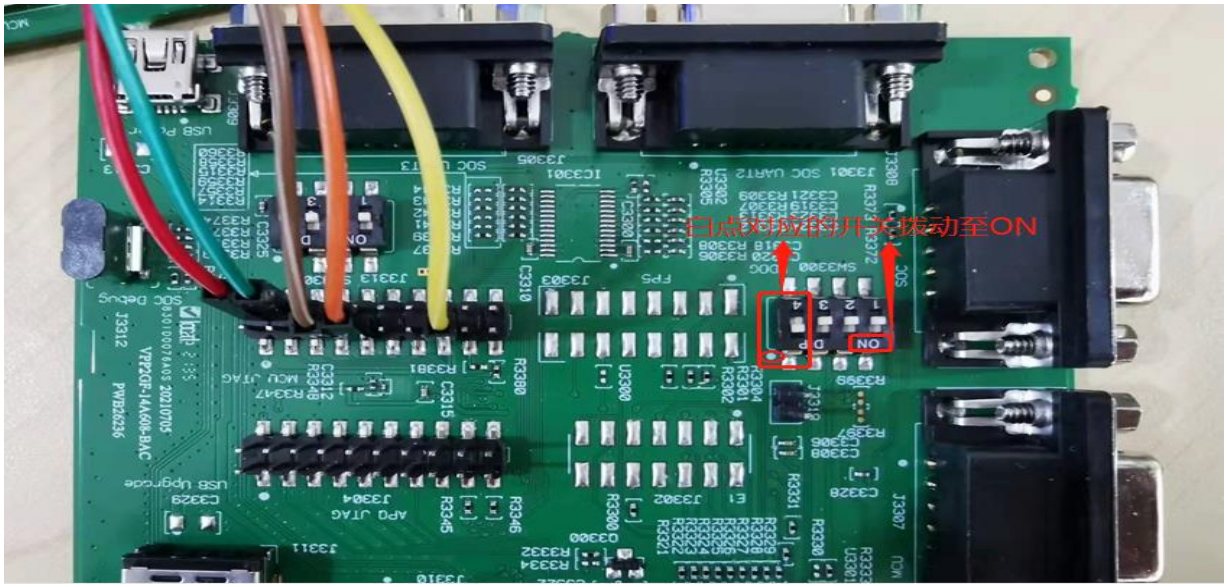
✧ MiniProg4 与 Debug JTAG Pin 脚映射表

No	MiniProg4	Debug JTAG
1	VTARG	2(VCC)
2	GND	4(GND)
3	XRES	15(RESET)
4	SWCLK	9(SWCLK)
5	SWDIO	7(SWDIO)

【注意】：按照以上映射表连接 debug 板和 MiniProg4（刷 MCU 需要连接 15（RESET））。

✧ 接线要求

1. Debug 上 SW3300 板小白点处开关拨动至 ON 状态，其余拨到 OFF(非 ON 状态)。



2.MiniProg4 接口示意图：

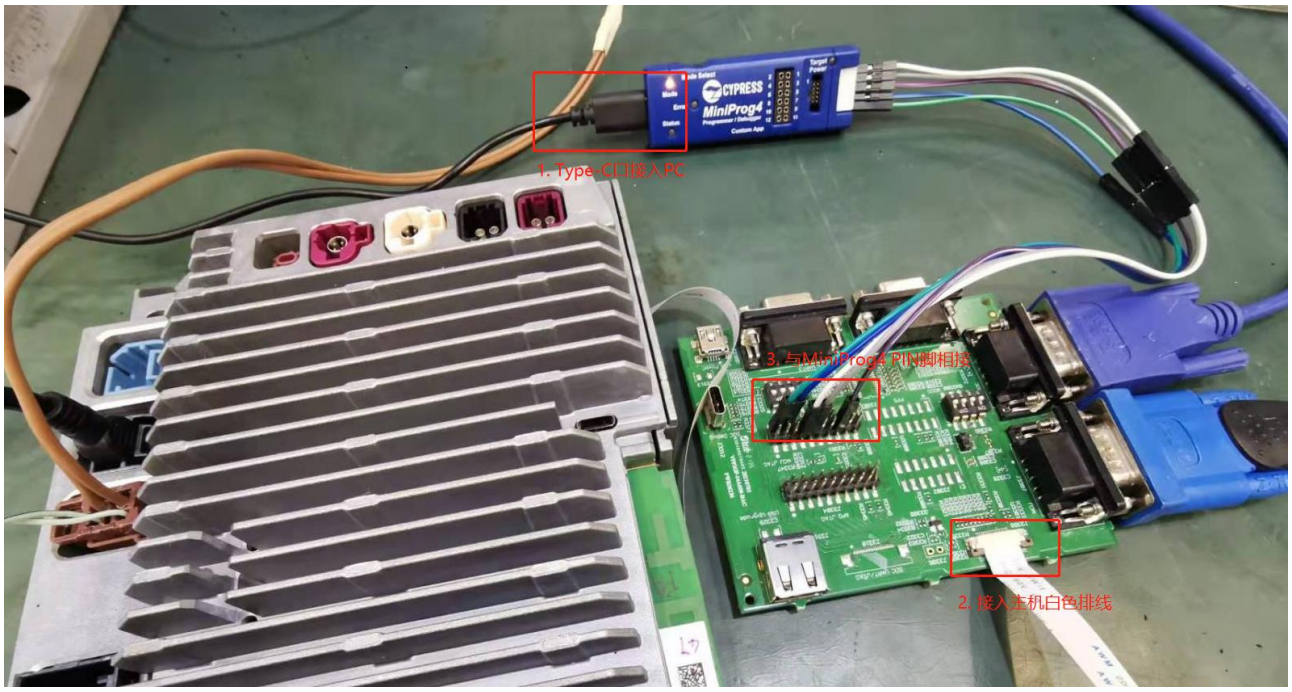
Figure 2-1. Top View

Figure 2-2. Bottom View

3.接线示意图：

可参考下图硬件接线，保证下述 3 点即可：

- Type-C 口接入 PC
- 主机白色排线接入 Debug 板
- Debug 板上 5 个 PIN 脚与 MiniProg4 PIN 脚一一对接



Miniprog 烧录 FBL 基础环境

相关文件已通过 Jfrog 更新发布,每个正式版本的根目录都会放置 MCU 刷机脚本：

例如 R04 版本路径为：

http://136.18.248.78:8082/artifactory/CDC-Ford-phase5-29662/Internal-Release/MCU/R04/MCU-VBF-COMMON-FILE-V2-0.7z

注：

✧ 其中 Internal-Release 集成阶段路径，若为正式释放阶段需将 Internal-Release 替换为 Formal-Release 再访问,例如释放到 REC 阶段需访问

http://136.18.248.78:8082/artifactory/CDC-Ford-phase5-29662/Formal-Release/MCU/R04/ MCU-VBF-COMMON-FILE-V2-0.7z

✧ 上述示例为 R04 脚本，其他版本发布时将 R04 替换为其他版本访问即可，例如 R05

http://136.18.248.78:8082/artifactory/CDC-Ford-phase5-29662/Internal-Release/MCU/R05/ MCU-VBF-COMMON-FILE-VXXX.7z

➢ **升级脚本目录：MCU Burning Script\MiniProg**

具体内容为：

cyt2bl_flash_program-vbf.cfg	2022/6/17 14:18	CFG 文件	1 KB
Hsm_Fbl_Bm_Bank0.hex	2022/6/13 15:32	HEX 文件	1,278 KB
Hsm_Fbl_Bm_Bank1.hex	2022/6/13 15:34	HEX 文件	1,278 KB
StartFlashUpdate-vbf.bat	2022/6/15 12:13	Windows 批处理...	1 KB

✧ **文件“StartFlashUpdate-vbf.bat”为升级脚本，用户仅需双击此脚本“StartFlashUpdate-vbf.bat”开始 FBL 基础镜像烧录。(烧录前保证机器正常接上电源并上电)**

注意： 如果 AutoFlashUtil 软件安装没使用默认路径，那么烧录脚本 StartFlashUpdate-vbf.bat 中变量 AFU_PATH 按实际安装路径更新

StartFlashUpdate-vbf.bat

```
1  SET AFU_PATH=C:/Program Files (x86)/Infineon/Auto Flash Utility 1.2
2
3  ::Detect mcu
4  call "%AFU_PATH%/bin/openocd.exe" -s "%AFU_PATH%/scripts" -f interface/kitprog3.cfg -c
```

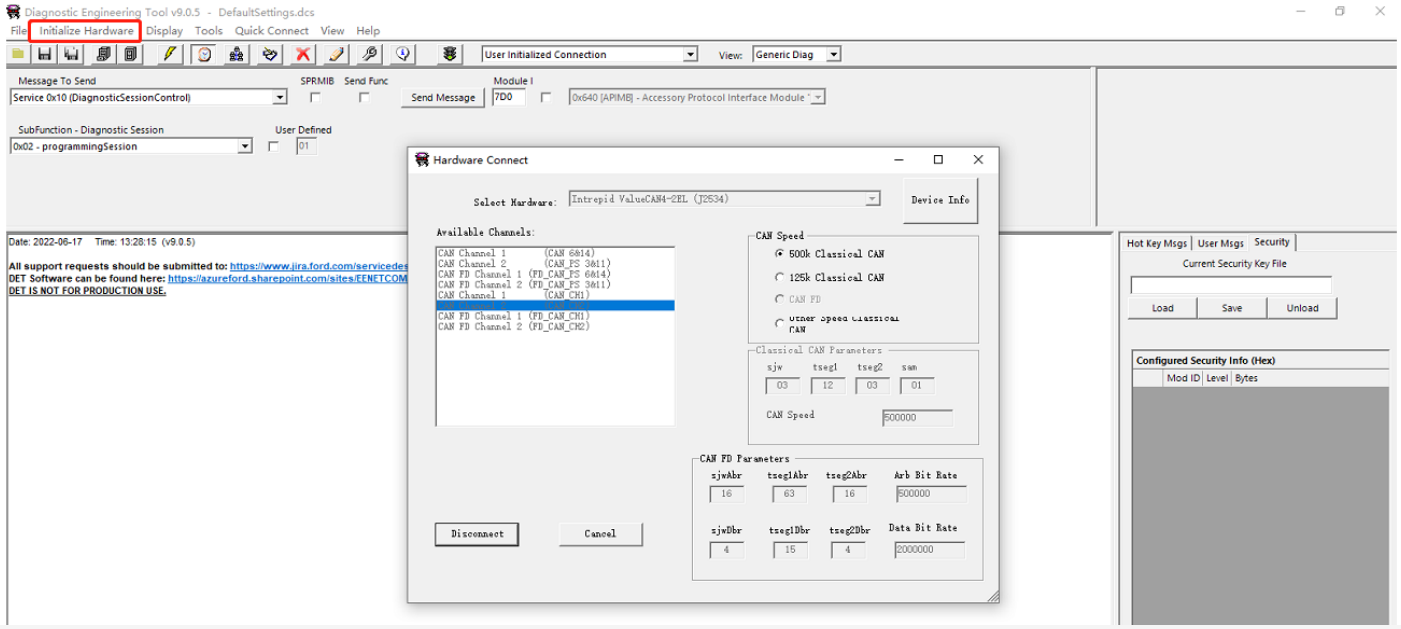
✧ **烧录成功后提示如下：**

```
traveo2_be_4m.cpu.cm0 halted due to debug-request, current mode: Thread
xPSR: 0x41000000 pc: 0x000002a4 msp: 0x08080000
** Device acquired successfully
** traveo2_be_4m.cpu.cm4: Ran after reset and before halt...
traveo2_be_4m.cpu.cm4 halted due to debug-request, current mode: Thread
xPSR: 0x01000000 pc: 0x000001bc msp: 0x0807f800
** Programming Started **
auto erase enabled
Info : Padding image section 0 at 0x1007fc04 with 508 bytes (bank write end alignment)
Warn : Adding extra erase range, 0x1007fe00 .. 0x1007ffff
[100%] [################################] [ Erasing     ]
[100%] [################################] [ Programming ]
wrote 523776 bytes from file ./Hsm_Fbl_Bm_Bank0.hex in 7.656964s (66.802 KiB/s)
** Programming Finished **
Info : SWD DPIDR 0x6ba02477
Info : kitprog3: acquiring the device (mode: reset)...
traveo2_be_4m.cpu.cm0 halted due to debug-request, current mode: Thread
xPSR: 0x41000000 pc: 0x000002a4 msp: 0x08080000
** Device acquired successfully
** traveo2_be_4m.cpu.cm4: Ran after reset and before halt...
traveo2_be_4m.cpu.cm4 halted due to debug-request, current mode: Thread
xPSR: 0x01000000 pc: 0x000001bc msp: 0x0807f800
** Programming Started **
auto erase enabled
Info : Padding image section 0 at 0x10277c04 with 508 bytes (bank write end alignment)
Warn : Adding extra erase range, 0x10277e00 .. 0x10277fff
[100%] [################################] [ Erasing     ]
[100%] [################################] [ Programming ]
wrote 523776 bytes from file ./Hsm_Fbl_Bm_Bank1.hex in 7.861712s (65.062 KiB/s)
** Programming Finished **
** Verify Started **
verified 523268 bytes in 0.667213s (765.878 KiB/s)
** Verified OK **
** Resetting Target **
Info : SWD DPIDR 0x6ba02477
shutdown command invoked
Info : traveo2_be_4m.dap: powering down debug domain...
请按任意键继续. . .
```

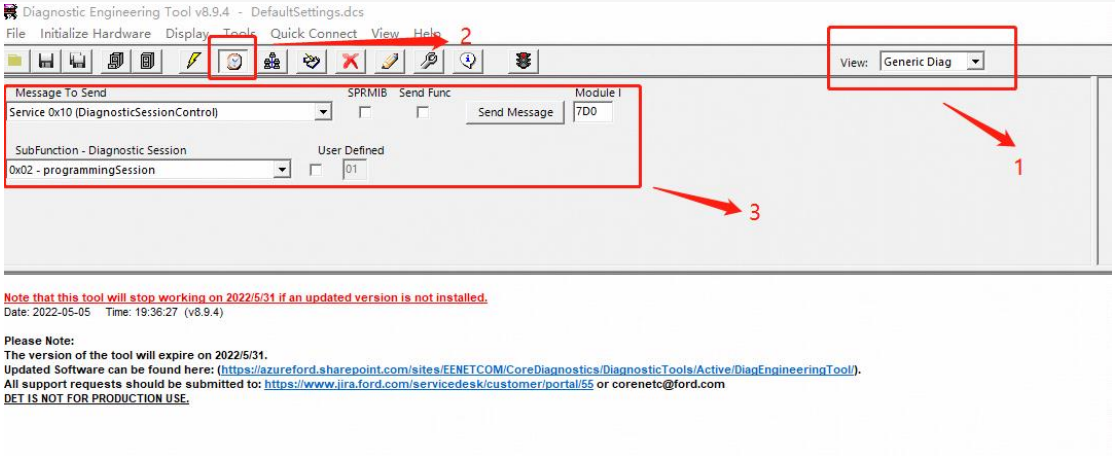
DET 烧录 MCU 版本

✧ **完成 Miniprog 烧录后需要确认 FBL 环境是否刷成功，确认步骤如下：**

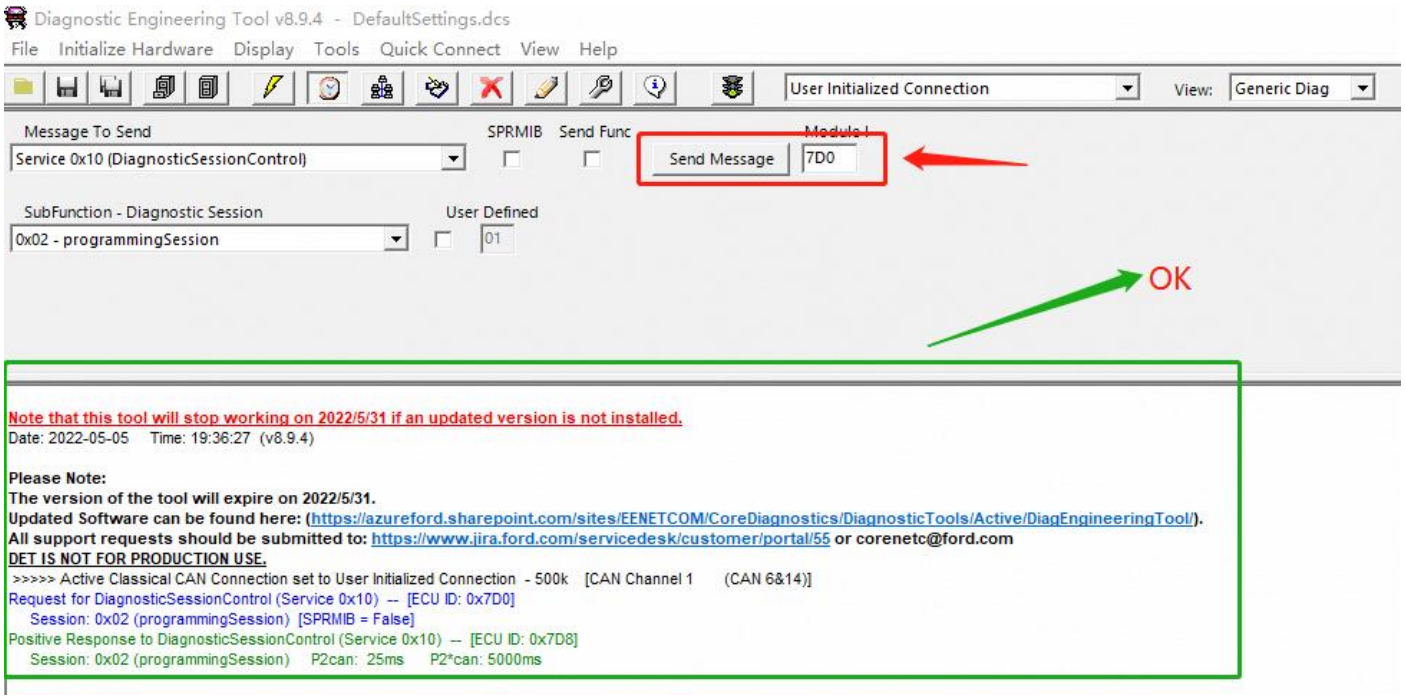
✓ 打开 DET 工具并连接 CAN 设备



✓ 执行下面的步骤，必须**确保第 2 步“Periodic Tester Present” button 被选中**

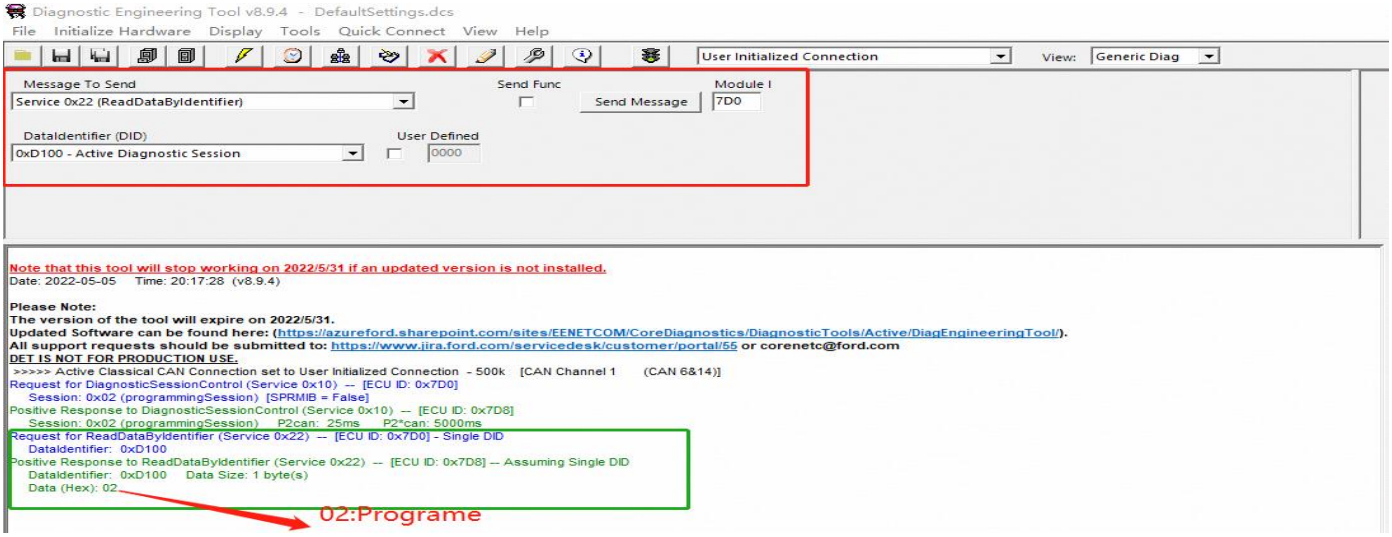


✓ 点击发送按钮

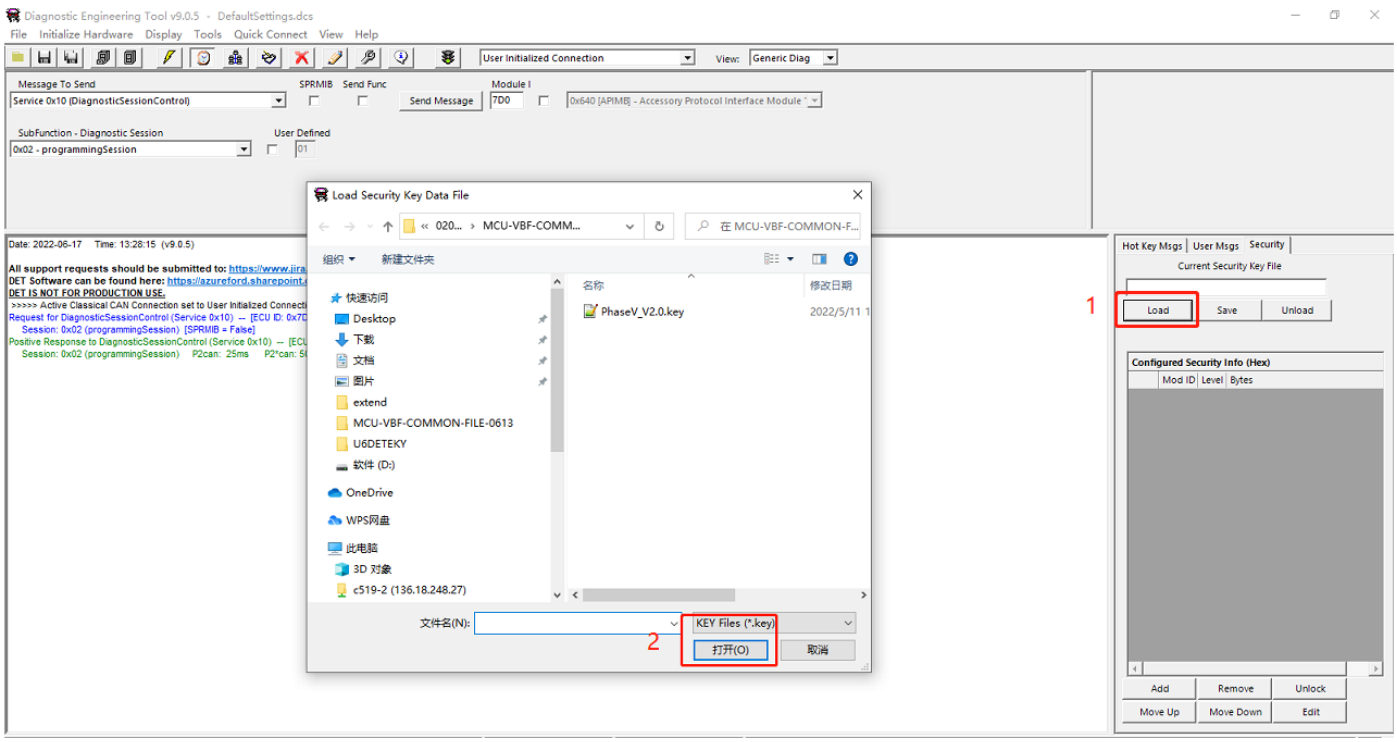


✓ 执行如下的配置《"Message To Send": Service 0x22; “DataIdentifier”: 0xD100》,然后选择发送

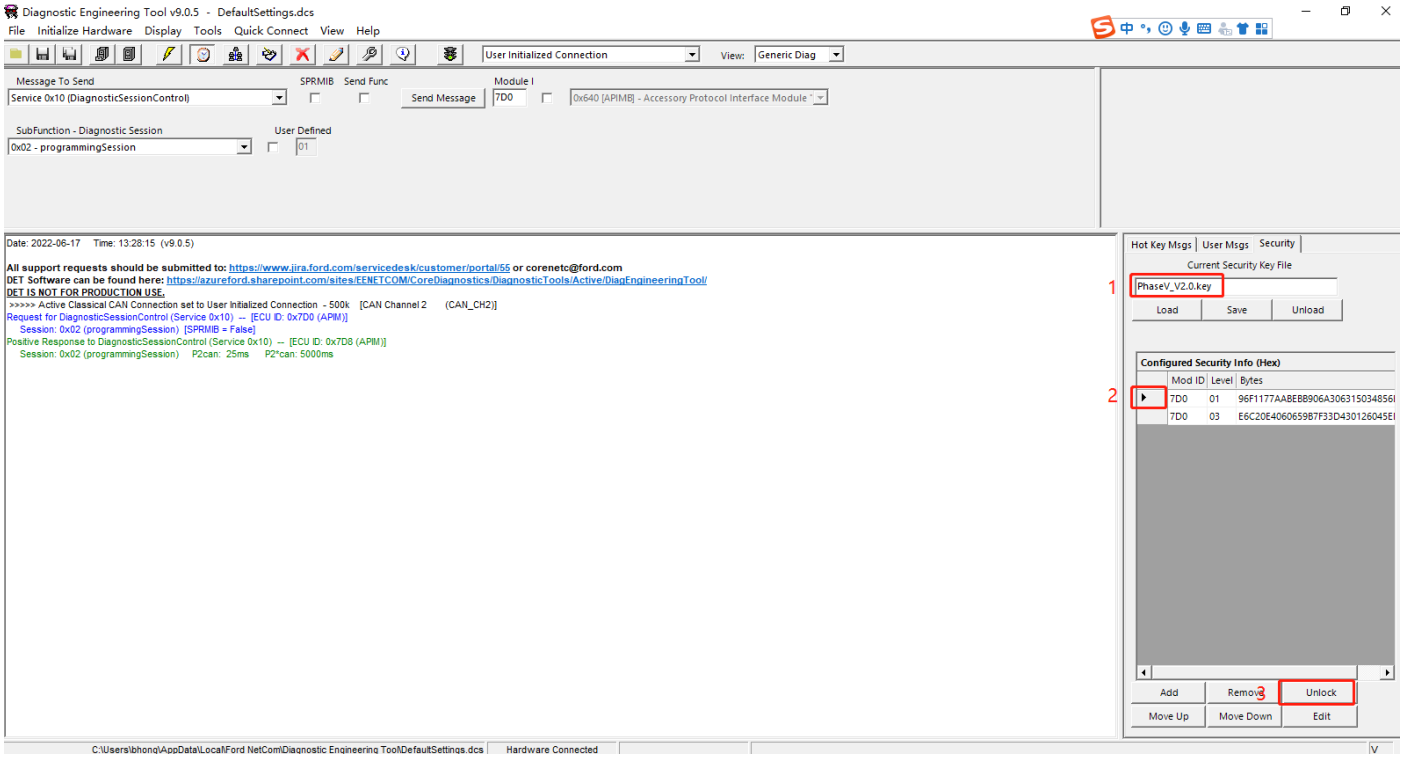
如果“**Data(Hex): 02**”意味则 FBL 环境是存在的，可以继续后面的升级动作，否则代表 Miniprog 烧录 FBL 基础环境失败。



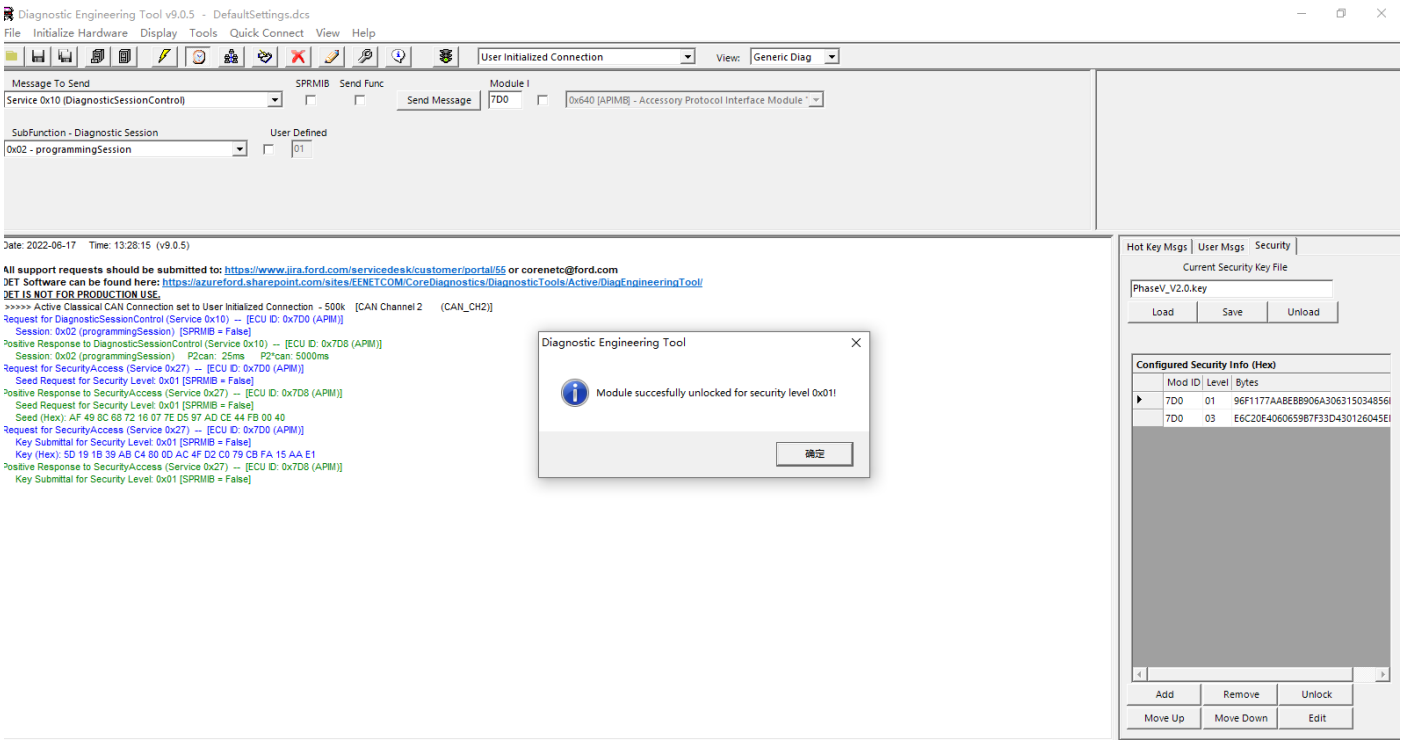
✓ 执行如下步骤完成 Key 的加载（对应的 Key 文件一般都会存放在 Jfrog 中每个正式版本中的 VBF-COMMON-FILE 压缩包，图中 Key 文件命名仅为示例，实际命名参考发布命名即可），**切记 Key 文件一定要与正式释放版本匹配。**



✓ 执行如下步骤完成解锁（注意第 2 步需要选择 01 level）

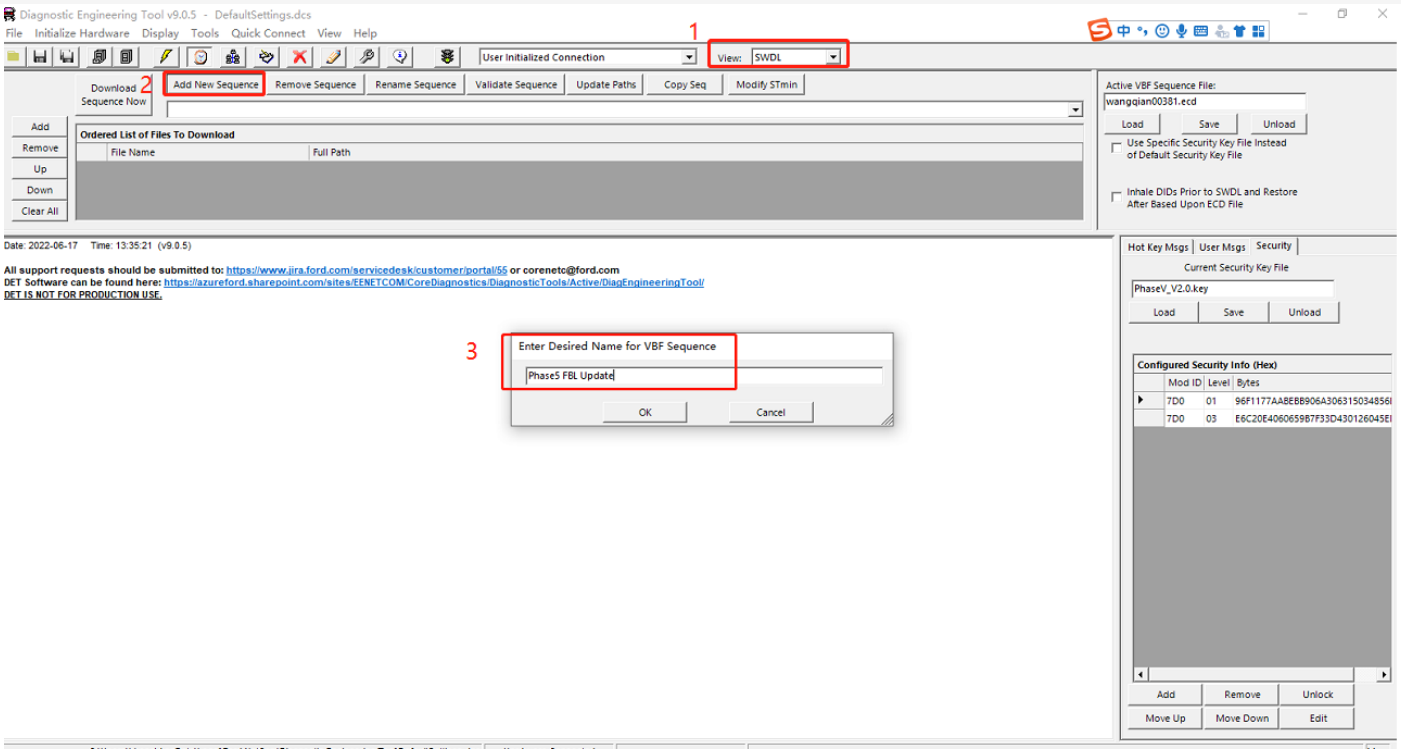

Diagnostic Engineering Tool v9.0.5 - DefaultSettings.dcs
File Initialize Hardware Display Tools Quick Connect View Help
User Initialized Connection
View: Generic Diag
Message To Send
Service 0x10 (DiagnosticSessionControl)
SPRMIB
Send Func
Send Message
Module I
7D0
0x640 [APIMB] - Accessory Protocol Interface Module
SubFunction - Diagnostic Session
0x02 - programmingSession
User Defined
01
Date: 2022-06-17 Time: 13:28:15 (v9.0.5)
All support requests should be submitted to: https://www.jira.ford.com/servicedesk/customer/portal/55 or corenetc@ford.com
DET Software can be found here: https://azureford.sharepoint.com/sites/EENETCOM/CoreDiagnostics/DiagnosticTools/Active/DiagEngineeringTool/
DET IS NOT FOR PRODUCTION USE.
>>>>> Active Classical CAN Connection set to User Initialized Connection - 500k [CAN Channel 2 (CAN_CH2)]
Request for DiagnosticSessionControl (Service 0x10) -- [ECU ID: 0x7D0 (APIM)]
Session: 0x02 (programmingSession) [SPRMIB = False]
Positive Response to DiagnosticSessionControl (Service 0x10) -- [ECU ID: 0x7D8 (APIM)]
Session: 0x02 (programmingSession) P2can: 25ms P2*can: 5000ms
Hot Key Msgs
User Msgs
Security
Current Security Key File
1
PhaseV_V2.0.key
Load
Save
Unload
Configured Security Info (Hex)
Mod ID
Level
Bytes
2
7D0 01 96F1177AABEBB906A306315034856
7D0 03 E6C20E4060659B7F33D430126045E
Add
Remove
3
Unlock
Move Up
Move Down
Edit
C:\Users\bhong\AppData\Local\Ford NetCom\Diagnostic Engineering Tool\DefaultSettings.dcs
Hardware Connected

✓ 解锁成功提示如下

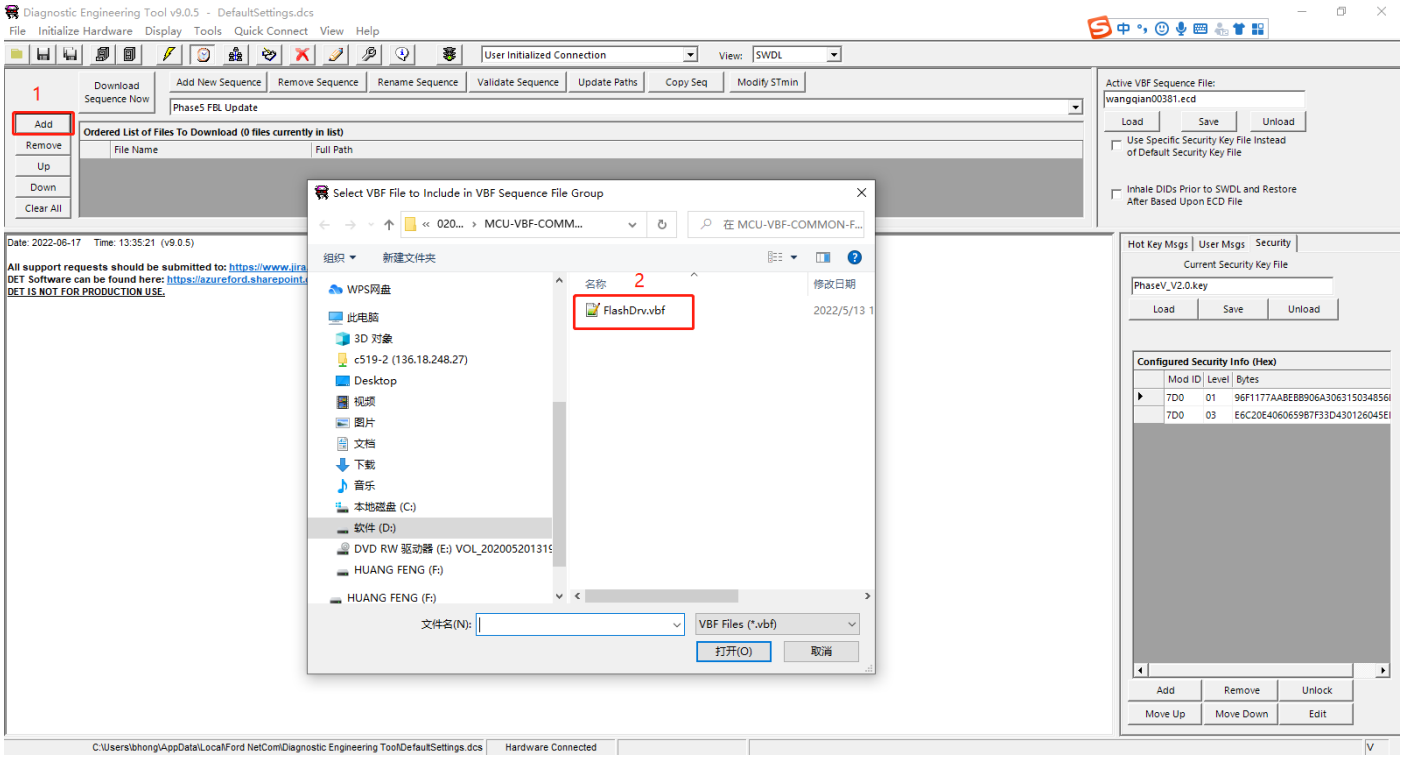

Diagnostic Engineering Tool v9.0.5 - DefaultSettings.dcs
File Initialize Hardware Display Tools Quick Connect View Help
User Initialized Connection
View: Generic Diag
Message To Send
Service 0x10 (DiagnosticSessionControl)
SPRMIB
Send Func
Send Message
Module I
7D0
0x640 [APIMB] - Accessory Protocol Interface Module
SubFunction - Diagnostic Session
0x02 - programmingSession
User Defined
01
Date: 2022-06-17 Time: 13:28:15 (v9.0.5)
All support requests should be submitted to: https://www.jira.ford.com/servicedesk/customer/portal/55 or corenetc@ford.com
DET Software can be found here: https://azureford.sharepoint.com/sites/EENETCOM/CoreDiagnostics/DiagnosticTools/Active/DiagEngineeringTool/
DET IS NOT FOR PRODUCTION USE.
>>>>> Active Classical CAN Connection set to User Initialized Connection - 500k [CAN Channel 2 (CAN_CH2)]
Request for DiagnosticSessionControl (Service 0x10) -- [ECU ID: 0x7D0 (APIM)]
Session: 0x02 (programmingSession) [SPRMIB = False]
Positive Response to DiagnosticSessionControl (Service 0x10) -- [ECU ID: 0x7D8 (APIM)]
Session: 0x02 (programmingSession) P2can: 25ms P2*can: 5000ms
Request for SecurityAccess (Service 0x27) -- [ECU ID: 0x7D0 (APIM)]
Seed Request for Security Level: 0x01 [SPRMIB = False]
Positive Response to SecurityAccess (Service 0x27) -- [ECU ID: 0x7D8 (APIM)]
Seed Request for Security Level: 0x01 [SPRMIB = False]
Seed (Hex): AF 49 8C 68 72 16 07 7E D5 97 AD CE 44 FB 00 40
Request for SecurityAccess (Service 0x27) -- [ECU ID: 0x7D0 (APIM)]
Key Submittal for Security Level: 0x01 [SPRMIB = False]
Key (Hex): 5D 19 1B 39 AB C4 80 0D AC 4F D2 C0 79 CB FA 15 AA E1
Positive Response to SecurityAccess (Service 0x27) -- [ECU ID: 0x7D8 (APIM)]
Key Submittal for Security Level: 0x01 [SPRMIB = False]
Diagnostic Engineering Tool
Module succesfully unlocked for security level 0x01!
确定
Hot Key Msgs
User Msgs
Security
Current Security Key File
PhaseV_V2.0.key
Load
Save
Unload
Configured Security Info (Hex)
Mod ID
Level
Bytes
7D0 01 96F1177AABEBB906A306315034856
7D0 03 E6C20E4060659B7F33D430126045E
Add
Remove
Unlock
Move Up
Move Down
Edit

✓ 执行如下步骤进入 SWDL 模式

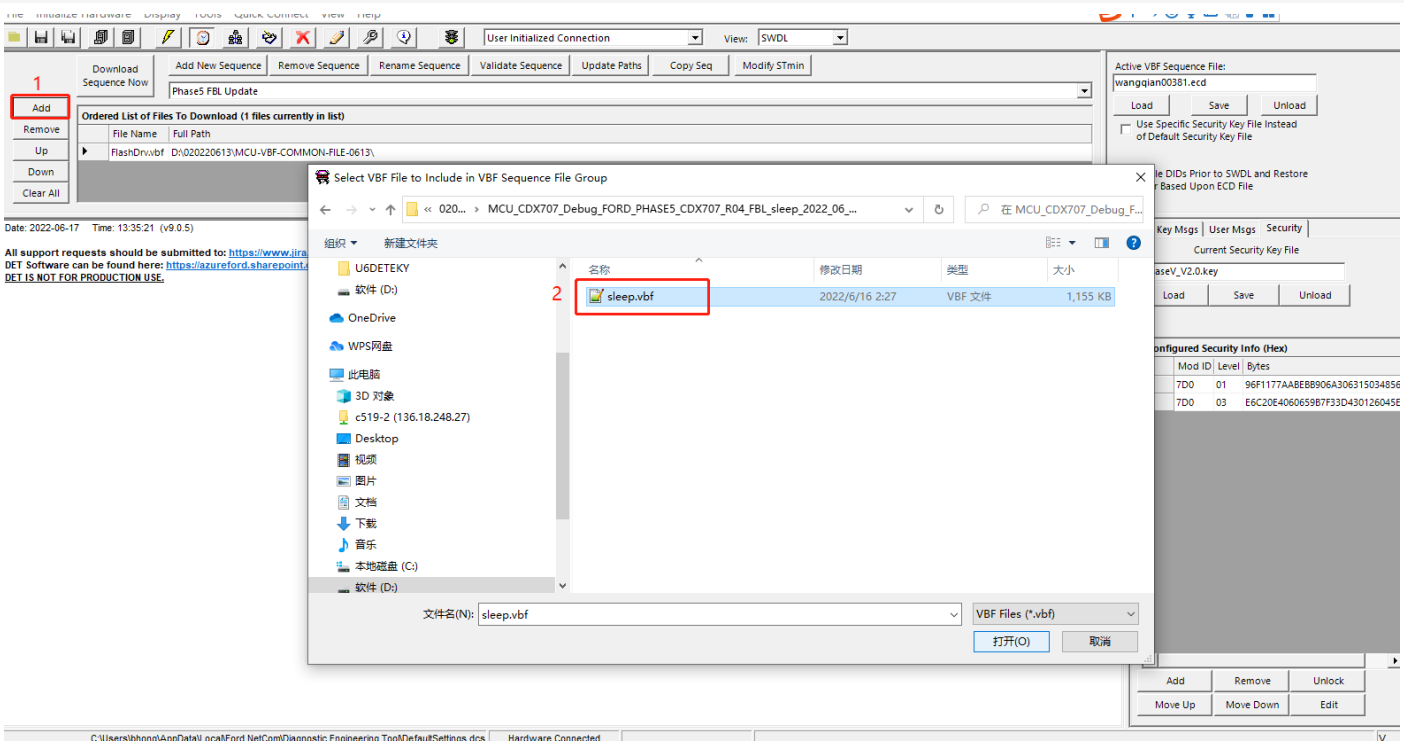
✓ 添加 New Sequence，名称可自定义



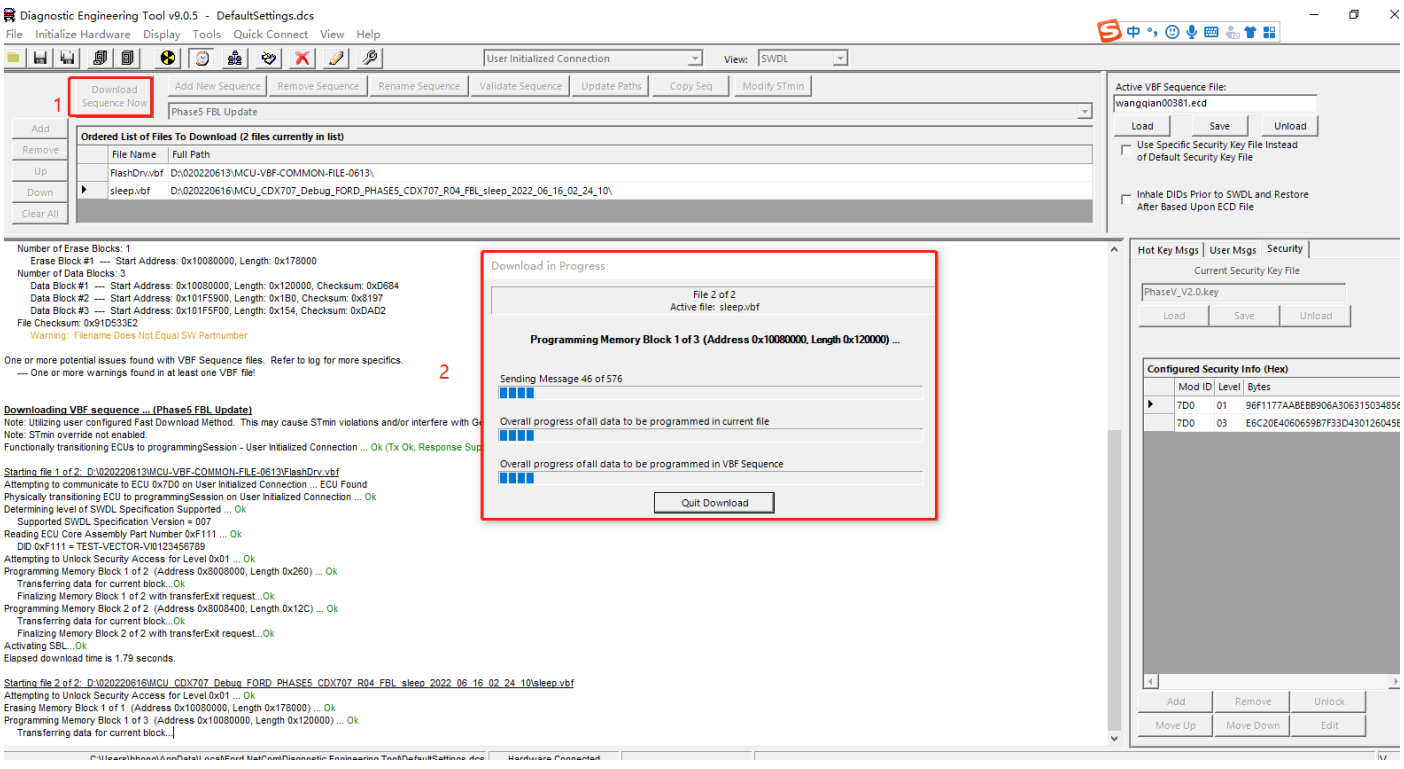
✓ 执行如下步骤添加 FlashDrv.vbf（对应的 FlashDrv.vbf 文件一般都会存放在 Jfrog 中每个正式版本中的 VBF-COMMON-FILE 压缩包）



✓ 执行如下步骤添加 XXX.vbf(**此文件名称取决于正式释放的版本命名**)



✓ 点击《Download Sequence Now》开始升级



✓ 升级完成提示如下，系统会自动重启