1. Safety Precautions

1-1. Repair Precaution

Before attempting any repair or detailed tuning, shield the device from RF noise or static
electricity discharges.

Use only demagnetized tools that are specifically designed for small electronic repairs,
as most electronic parts are sensitive to electromagnetic forces.

Use only high quality screwdrivers when servicing products. Low quality screwdrivers can
easily damage the heads of screws.

Use only conductor wire of the properly gauge and insulation for low resistance, because of the low margin
of error of most testing equipment.
We recommend 22-gauge twisted copper wire.

Hand-soldering is not recommended, because printed circuit boards (PCBs) can be easily
damaged, even with relatively low heat. Never use a soldering iron with a power rating of
more than 100 watts and use only lead-free solder with a melting point below 250°C (482°F).

Prior to disassembling the battery charger for repair, ensure that the AC power is disconnected.
Always use the replacement parts that are registered in the SEC system. Third-party replacement parts
may not function properly.

1. Safety Precautions

1-2. ESD(Electrostatically Sensitive Devices) Precaution

Many semiconductors and ESDs in electronic devices are particularly sensitive to static discharge and can be easily damaged by it. We recommend protecting these components with conductive anti-static bags when you store or transport them.

Always use an anti-static strap or wristband and remove electrostatic buildup or dissipate static electricity from your body before repairing ESDs.

Ensure that soldering irons have AC adapter with ground wires and that the ground wires are properly connected.

Use only desoldering tools with plastic tips to prevent static discharge.

Properly shield the work environment from accidental electrostatic discharge before opening packages containing ESDs.

The potential for static electricity discharge may be increased in low humidity environments, such as air-conditioned rooms. Increase the airflow to the working area to decrease the chance of accidental static electricity discharges.

2. Specification

2-1. Radio Frequency & Channel

1) LTE BAND frequency (SM-A260G)

Equa.	Freq. Range	CH Range
FUL = FUL_low+0.1(NUL-NOffs-UL)	LB1 : 1920 ~ 1980	18000≤N≤18599
	LB3 : 1710 ~ 1785	19200≤N≤19949
	LB5 : 824 ~ 849	20400≤N≤20649
	LB7 : 2500 ~ 2570	20750≤N≤21449
	LB8 : 880 ~ 915	21450≤N≤21799
	LB40 : 2300 ~ 2400	38650≤N≤39649
	LB41 : 2496 ~ 2690	39650≤N≤41589
FDL = FDL_low+0.1(NDL-NOffs-DL)	LB1 : 2110 ~ 2170	0≤N≤599
	LB3 : 1805 ~ 1880	1200≤N≤1949
	LB5 : 869 ~ 894	2400≤N≤2649
	LB7 : 2620 ~ 2690	2750≤N≤3449
	LB8 : 925 ~ 960	3450≤N≤3799
	LB40 : 2300 ~ 2400	38650≤N≤39649
	LB41 : 2496 ~ 2690	39650≤N≤41589

1-1) LTE BAND frequency (SM-A260F)

Equa.	Freq. Range	CH Range
FUL = FUL_low+0.1(NUL-NOffs-UL)	LB1 : 1920 ~ 1980	18000≤N≤18599
	LB3 : 1710 ~ 1785	19200≤N≤19949
	LB7 : 2500 ~ 2570	20750≤N≤21449
	LB8 : 880 ~ 915	21450≤N≤21799
	LB20 : 832 ~ 862	24150≤N≤24449
FDL = FDL_low+0.1(NDL-NOffs-DL)	LB1 : 2110 ~ 2170	0≤N≤599
	LB3 : 1805 ~ 1880	1200≤N≤1949
	LB7 : 2620 ~ 2690	2750≤N≤3449
	LB8 : 925 ~ 960	3450≤N≤3799
	LB20 : 791 ~ 821	6150≤N≤6449

2. Specification

2) WCDMA BAND frequency (SM-A260G)

Equa.	Freq. Range	CH Range
Tx = N*0.2	WB1 : 1920 ~ 1980	9612≤N≤9888
	WB5 : 824 ~ 849	4132≤N≤4233
	WB8 : 880 ~ 915	2712≤N≤2863
Rx = N*0.2	WB1 : 2110 ~ 2170	10562≤N≤10838
	WB5 : 869 ~ 894	4357≤N≤4458
	WB8 : 925 ~ 960	2937≤N≤3088

2-1) WCDMA BAND frequency (SM-A260F)

Equa.	Freq. Range	CH Range
Tx = N*0.2	WB1 : 1920 ~ 1980	9612≤N≤9888
	WB8 : 880 ~ 915	2712≤N≤2863
Rx = N*0.2	WB1 : 2110 ~ 2170	10562≤N≤10838
	WB8 : 925 ~ 960	2937≤N≤3088

3) GSM BAND frequency (SM-A260G/F)

Equa.	Freq. Range	CH Range
Tx = 890+0.2*(N-1024)	GSM900 : 880 ~ 915	975≤N≤1023
Tx = 1710.2+0.2*(N-512)	DCS : 1710 ~ 1785	512≤N≤885
Rx = 935+0.2*(N-1024)	GSM900 : 925 ~ 960	975≤N≤1023
Rx = 1805.2+0.2*(N-512)	DCS : 1805 ~ 1880	512≤N≤885

2. Specification

2-2. GSM General Specification

Item		GSM 900	DCS1800
Freq. Band[MHz] Uplink/Downlink		880~915 925~960	1710~1785 1805~1880
ARFCN range		0~124 & 975~1023	512~885
Tx/Rx spacing		45 MHz	95 MHz
Mod. Bit rate/ Bit Period	GPRS	270.833 Kbps 3.692 us	270.833 Kbps 3.692 us
Time Slot Period/Frame Period		576.9 us 4.615 ms	576.9 us 4.615 ms
Modulation	GPRS	0.3 GMSK	0.3 GMSK
MS Power	GPRS	33 dBm~5 dBm	30 dBm~0 dBm
Power Level	GPRS	5 pcl~19 pcl	0 pcl~15 pcl
Sensitivity		-102 dBm	-100 dBm
TDMA Mux		8	8
Cell Radius		3 Km	2 Km

2. Specification

2-3-1. WCDMA General Specification [SM-A260F]

Item	WCDMA BAND1	WCDMA BAND8
Freq. Band[MHz] Uplink/Downlink	1920~1980 2110~2170	880~915 925~960
ARFCN range	9612~9888 10562~10838	2712~2863 2937~3088
Tx/Rx spacing	190MHz	45MHz
Mod. Bit rate/ Bit Period	3.84 Mcps/s	3.84 Mcps/s
Time Slot Period/Frame Period	10ms	10ms
Modulation	UL : HQPSK DL : QPSK	UL : HQPSK DL : QPSK
MS Power	Max:23.0dBm (+1~-3)dBm Min:<-50dBm	Max:23.0dBm (+1~-3)dBm Min:<-50dBm
Power Level	Class3	Class3
Sensitivity	-106.7dBm	-104.7dBm

2. Specification

2-3-2. WCDMA General Specification [SM-A260G]

Item	WCDMA BAND1	WCDMA BAND5	WCDMA BAND8
Freq. Band[MHz] Uplink/Downlink	1920~1980 2110~2170	824~849 869~894	880~915 925~960
ARFCN range	9612~9888 10562~10838	781~4233 1006~4458	2712~2863 2937~3088
Tx/Rx spacing	190MHz	45MHz	45MHz
Mod. Bit rate/ Bit Period	3.84 Mcps/s	3.84 Mcps/s	3.84 Mcps/s
Time Slot Period/Frame Period	10ms	10ms	10ms
Modulation	UL : HQPSK DL : QPSK	UL : HQPSK DL : QPSK	UL : HQPSK DL : QPSK
MS Power	Max:23.0dBm (+1~-3)dBm Min:<-50dBm	Max:23.0dBm (+1~-3)dBm Min:<-50dBm	Max:23.0dBm (+1~-3)dBm Min:<-50dBm
Power Level	Class3	Class3	Class3
Sensitivity	-106.7dBm	-104.7dBm	-104.7dBm

2. Specification

2-4-1. LTE General Specification [SM-A260F]

Band	Downlink (MHz)			Bandwidth	Uplink (MHz)			Duplex spacing
	Low	Middle	High	DL/UL (MHz)	Low	Middle	High	(MHz)
	Earfcn				Earfcn			
1	2110	2140	2170	60	1920	1950	1980	190
	0	300	599		18000	18300	18599	
3	1805	1842.5	1880	75	1710	1747.5	1785	95
	1200	1575	1949		19200	19575	19949	
7	2620	2655	2690	70	2500	2535	2570	120
	2750	3100	3449		20750	21100	21449	
8	925	942.5	960	35	880	897.5	915	45
	3450	3625	3799		21450	21625	21799	
20	791	806	821	30	832	847	862	41
	6150	6300	6449		24150	24300	24449	

2-4-2. LTE General Specification [SM-A260G]

Band	Downlink (MHz)			Bandwidth	Uplink (MHz)			Duplex spacing
	Low	Middle	High	DL/UL (MHz)	Low	Middle	High	(MHz)
	Earfcn				Earfcn			
1	2110	2140	2170	60	1920	1950	1980	190
	0	300	599		18000	18300	18599	
3	1805	1842.5	1880	75	1710	1747.5	1785	95
	1200	1575	1949		19200	19575	19949	
5	869	881.5	894	25	824	836.5	849	45
	2400	2525	2649		20400	20525	20649	
7	2620	2655	2690	70	2500	2535	2570	120
	2750	3100	3449		20750	21100	21449	
8	925	942.5	960	35	880	897.5	915	45
	3450	3625	3799		21450	21625	21799	
40 (TDD)	2300	2350	2400	100				
	38650	39150	39649					
41 (TDD)	2496	1593	2690	194				
	39650	40620	41589					

2. Specification

2-5. GSM BAND TX power control level

TX Power Control Level	GSM900	TX Power Control level	DCS1800
5	33±2 dBm	0	30±2 dBm
6	31±3 dBm	1	28±3 dBm
7	29±3 dBm	2	26±3 dBm
8	27±3 dBm	3	24±3 dBm
9	25±3 dBm	4	22±3 dBm
10	23±3 dBm	5	20±3 dBm
11	21±3 dBm	6	18±3 dBm
12	19±3 dBm	7	16±3 dBm
13	17±3 dBm	8	14±3 dBm
14	15±3 dBm	9	12±4 dBm
15	13±3 dBm	10	10±4 dBm
16	11±5 dBm	11	8±4 dBm
17	9±5 dBm	12	6±4 dBm
18	7±5 dBm	13	4±4 dBm
19	5±5 dBm	14	2±5 dBm
-	-	15	0±5 dBm

3. Product Function

Main Function

Item	Description
OS	Android GO
SM-A260F RF	2G : 900/ 1800 3G : B1/ B8 4G : B1/ B3/ B7/ B8/ B20
SM-A260G RF	2G : 900/ 1800 3G : B1/ B5/ B8 4G : B1/ B3/ B5/ B7/ B8/ B40/ B41
Battery	Incell 2,600mAh Battery
Base Band	Exynos7870 1.6GHz (Octa-Core)
Other RF	GPS, Glonass, Beidou, BT4.2, USB 2.0, WIFI 802.11 b/g/n 2.4GHz
Camera	5M + 5M Camera
LCD	4.98" qHD(540X960) Incell LCD
RAM	1GB RAM
Storage	8GB, 16GB eMMC(Option)
Sensor	Accelerometer, Proximity Sensor
Accessory	Charger: 5V/0.7A

6. Level 1 Repair

6-1. S/W Update

6-1-1. Preparation

- S/W Update program: **Fenrir 5.17.xxxx**

- Mobile Phone

- Data Cable

※ Settings
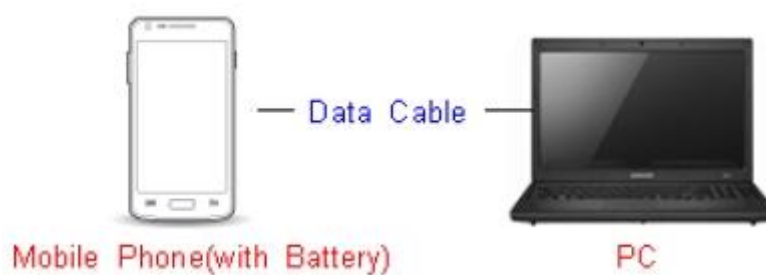
Data Cable : GH39-01710D

6. Level 1 Repair

6-1-2. How to use 'Fenrir' S/W update program.

1) Launch Fenrir by clicking on the icon on the desktop
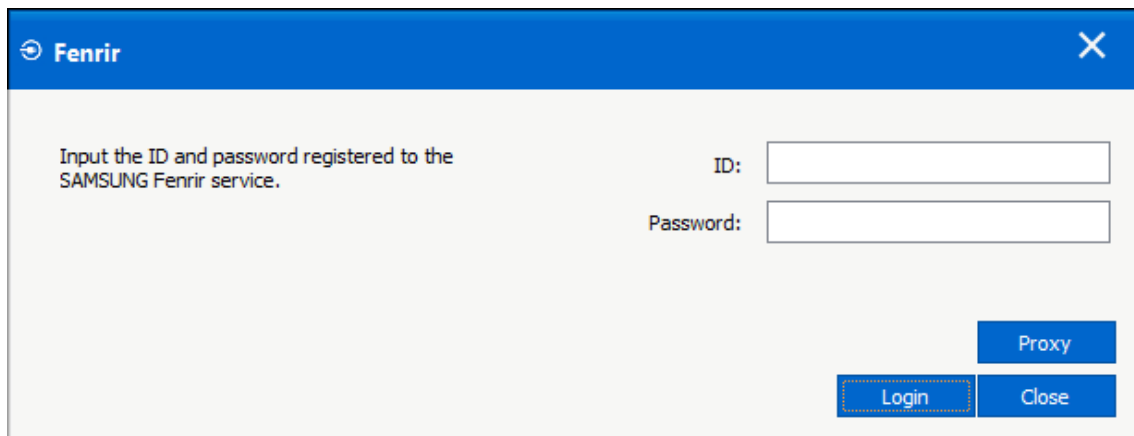
- SVH (Fenrir_Home) : It uses Home binary which does not have user data area in the memory when flashed to a device. (Keep user data)

- SVC (Fenrir_Factory) : It uses Factory binary which erases all user data in the memory when flashed to a device. (Clear user data)

- SVA (Fenrir_All) : It uses Factory and Home binaries. you can download Home and Factory binary in a PC(but requires double HDD storage and NW traffic)

2) Input ID & password
※You need to reset the ID information in case of PC change and format and repair, hard disk change

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6. Level 1 Repair

3) Ensure device has sufficient charge (at least 20%) to start firmware update.
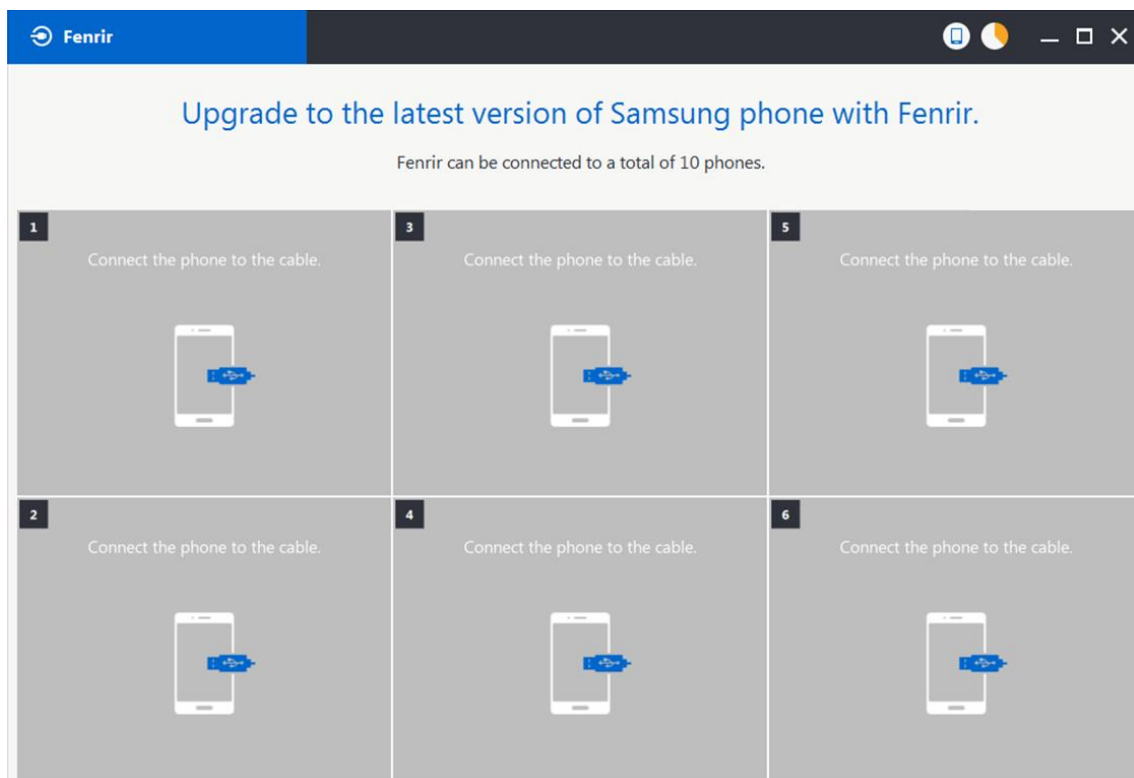
4) Connect the device to PC via data cable.

5) Upon USB connection, you will be presented with below screen.
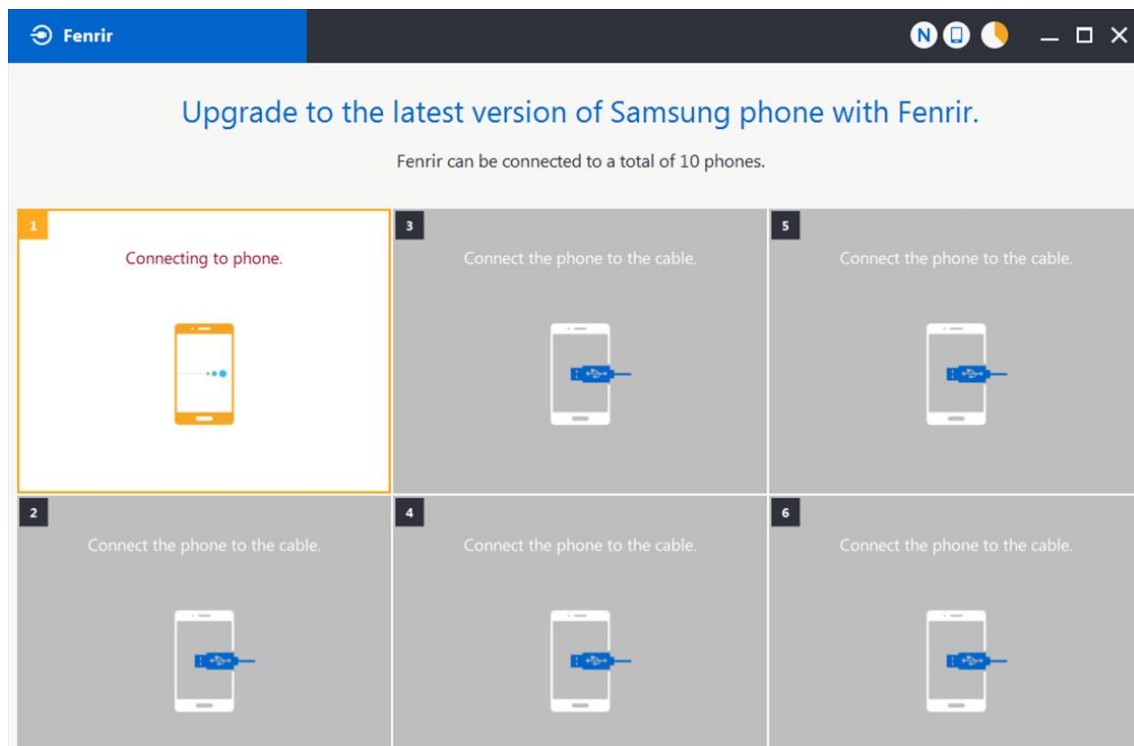
6. Level 1 Repair

6) Once device is detected, you will be presented with below screen.
To update S/W, select "S/W Update" or to exit select "SVC Connection". If you select "SVC Connection", only Fenrir connection history (record) will be stored in the FUS server to support warranty validation. (This is known as "Service Connection" history)
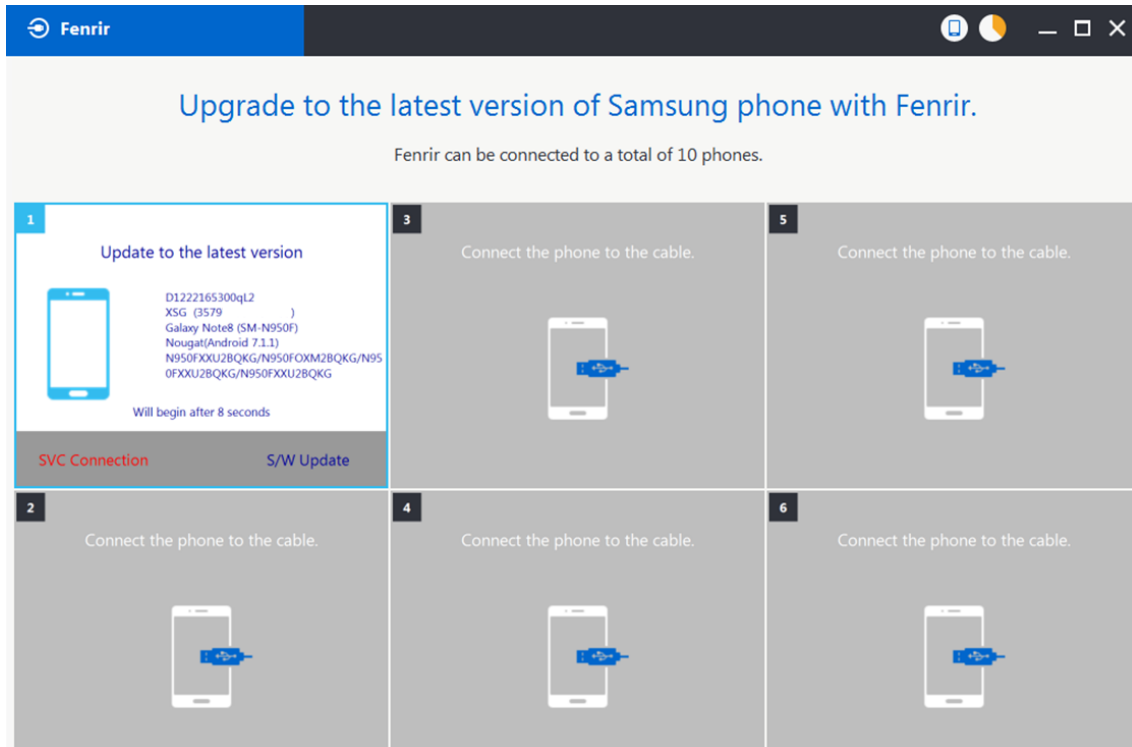
7) Once Fenrir starts, application will display the below screen.
And select the Start button & Agree button.
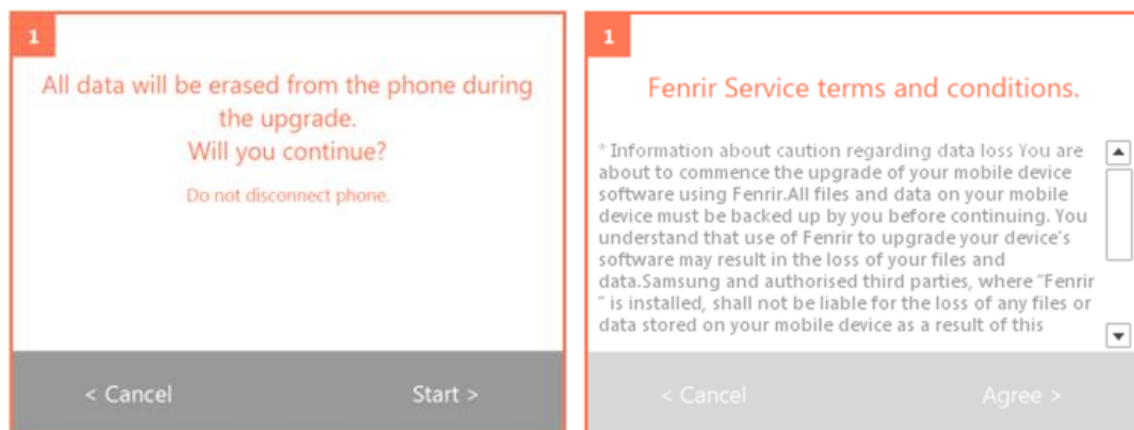
6. Level 1 Repair

8) The status circle increases as the update installs. The update process takes approximately 5-10 minutes to complete. Do not disconnect the device from USB during processing.
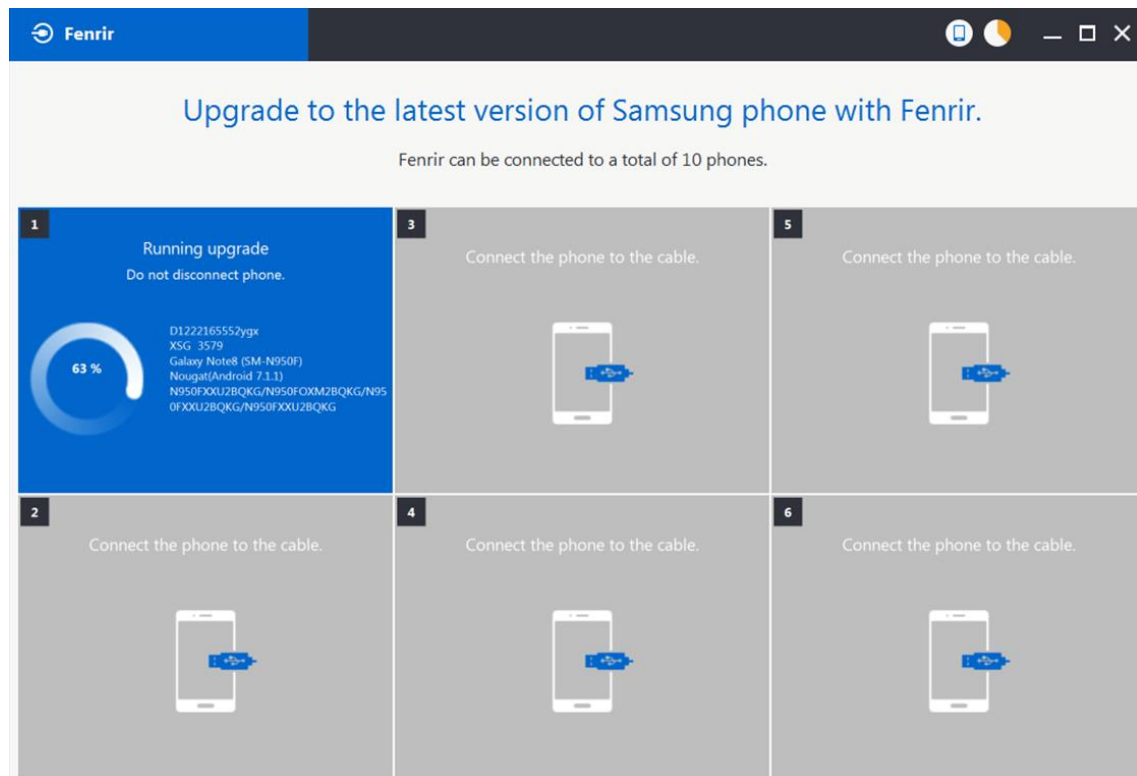
9) Once complete, application will present the below screen indicating update complete.
Click Ok and detach device from USB.
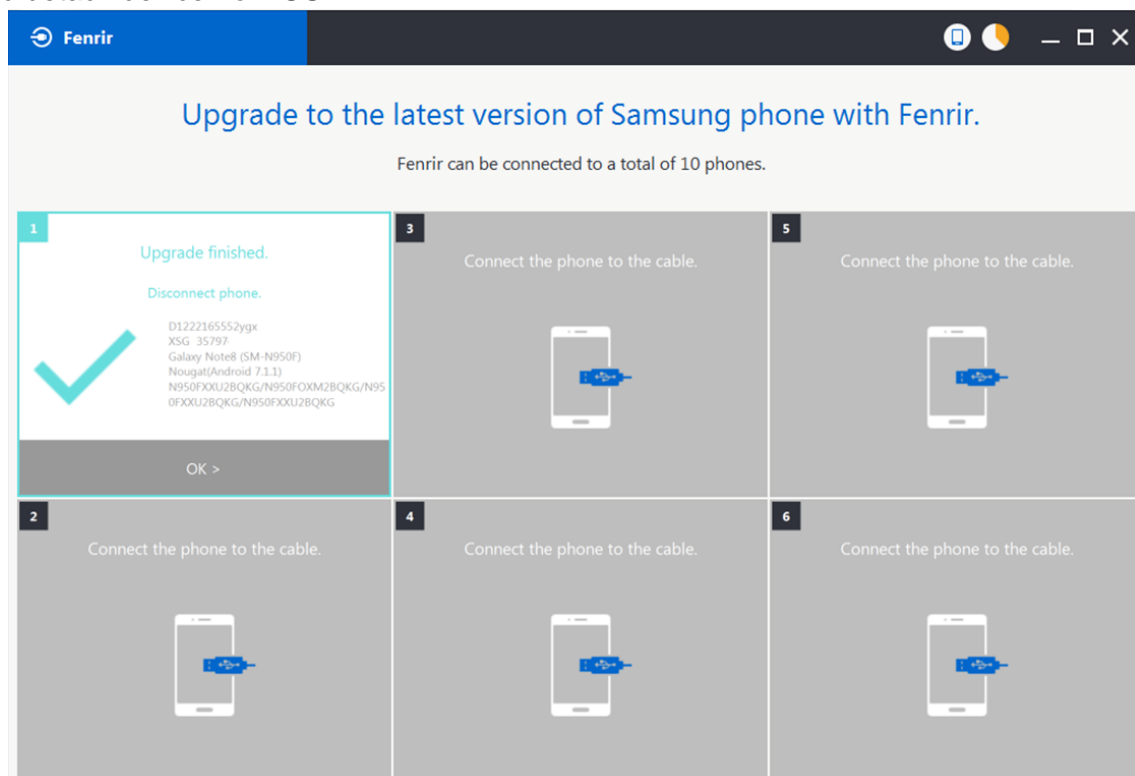
6. Level 1 Repair

6-2. How to use 'Odin' program

※ S/W Update via Fenrir is mandatory.
   Below is the method to use 'Odin' program in any specific case.

6-2-1. Preparation

- Installation program: **Odin3 v3.13.2.exe**
- Mobile Phone
- Data Cable
- S/W Binary files (downloaded from GSPN)

※ Settings

Mobile Phone(with Battery) ─ Data Cable ─ PC
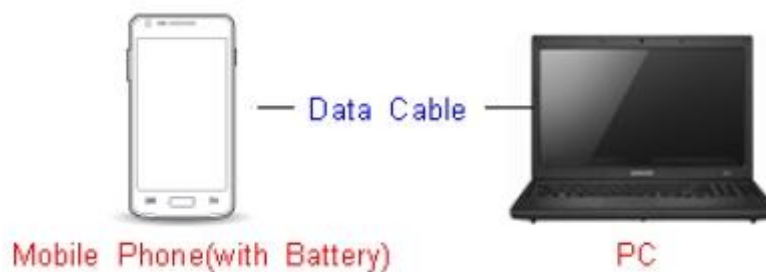
Data Cable : GH39-01710D

6. Level 1 Repair

6-2-2. S/W Installation Program (Downloader program)

Open up the S/W Installation Program by executing the **"Odin3 v3.12.10.exe"**

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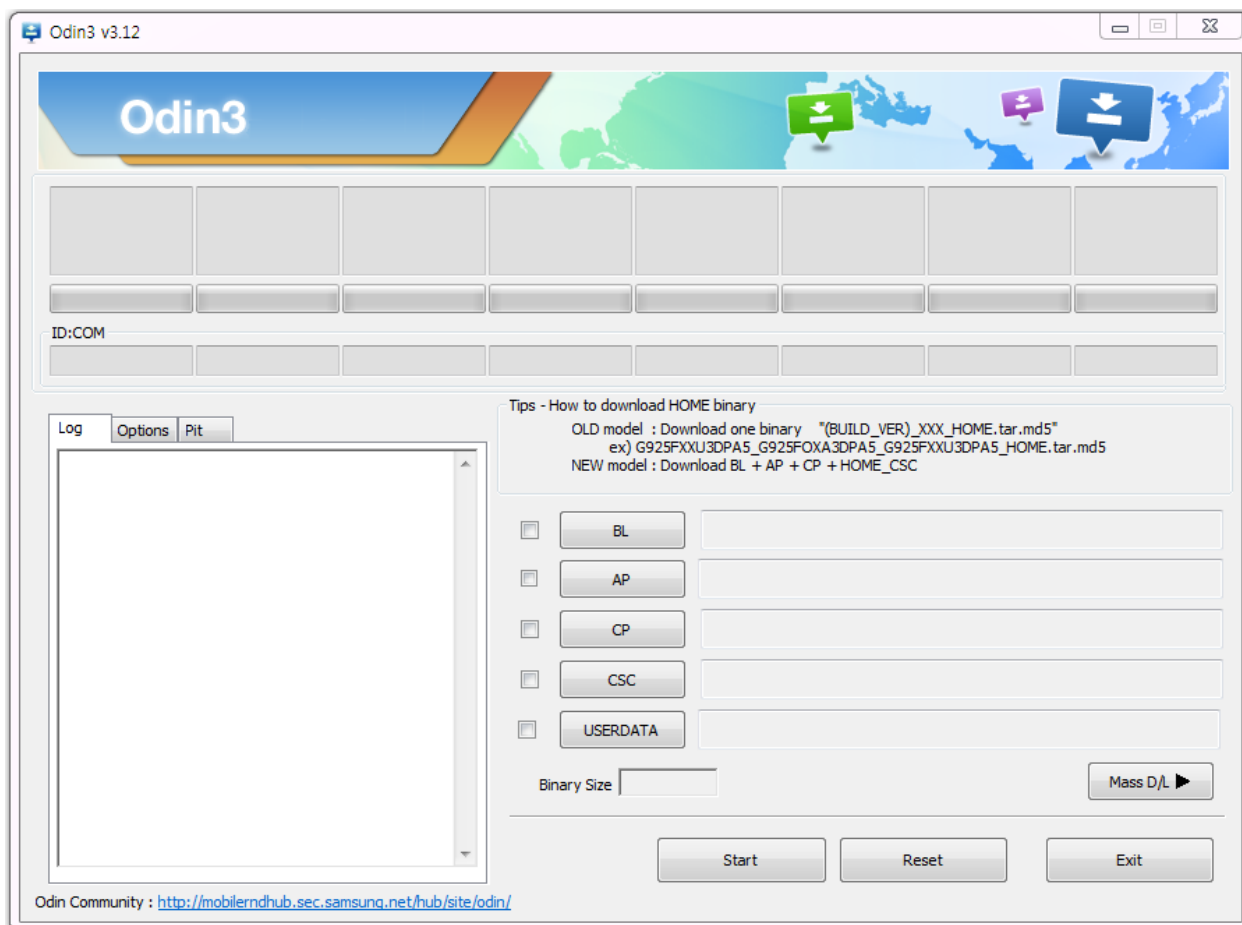
6. Level 1 Repair

1. Enable the check mark by click on the following options

- Check Auto Reboot, F. Reset Time, Nand Erase

- Check PIT

- Check BOOTLOADER, PDA, PHONE, CSC and USERDATA Files

* Note : "Odin v3.12.10 or above" checks MD5 checksum just after file selection.
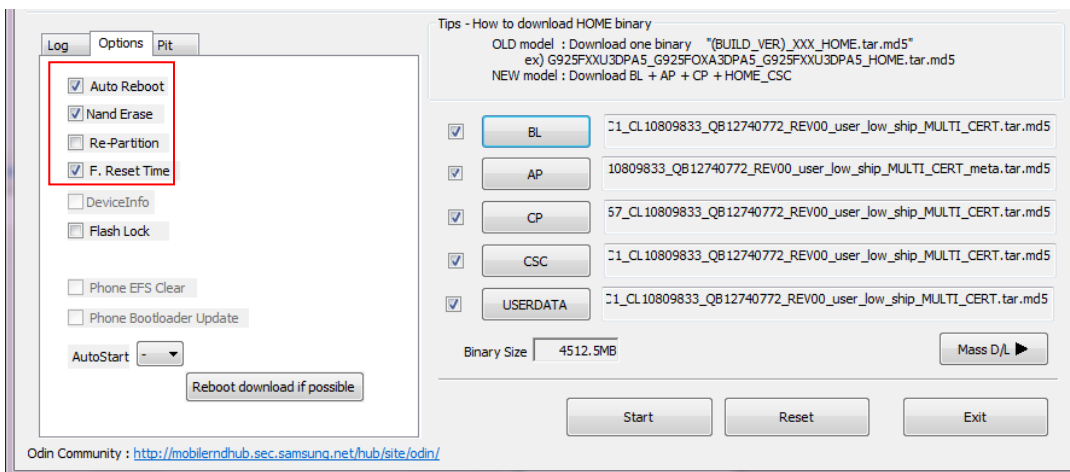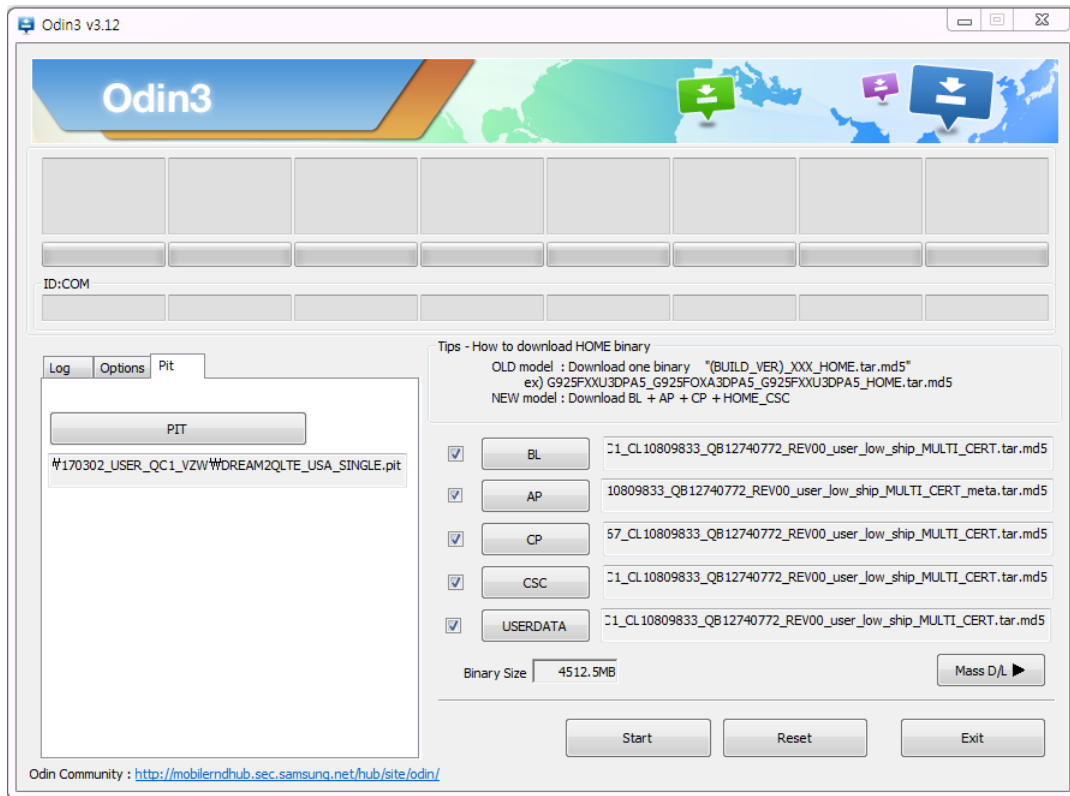
6. Level 1 Repair

2. Enter into Download Mode
  - Enter into Download Mode by pressing Volume Down button, and Volume Up button
    simultaneously and connecting USB cable
  - Press Volume Up button to download mode.
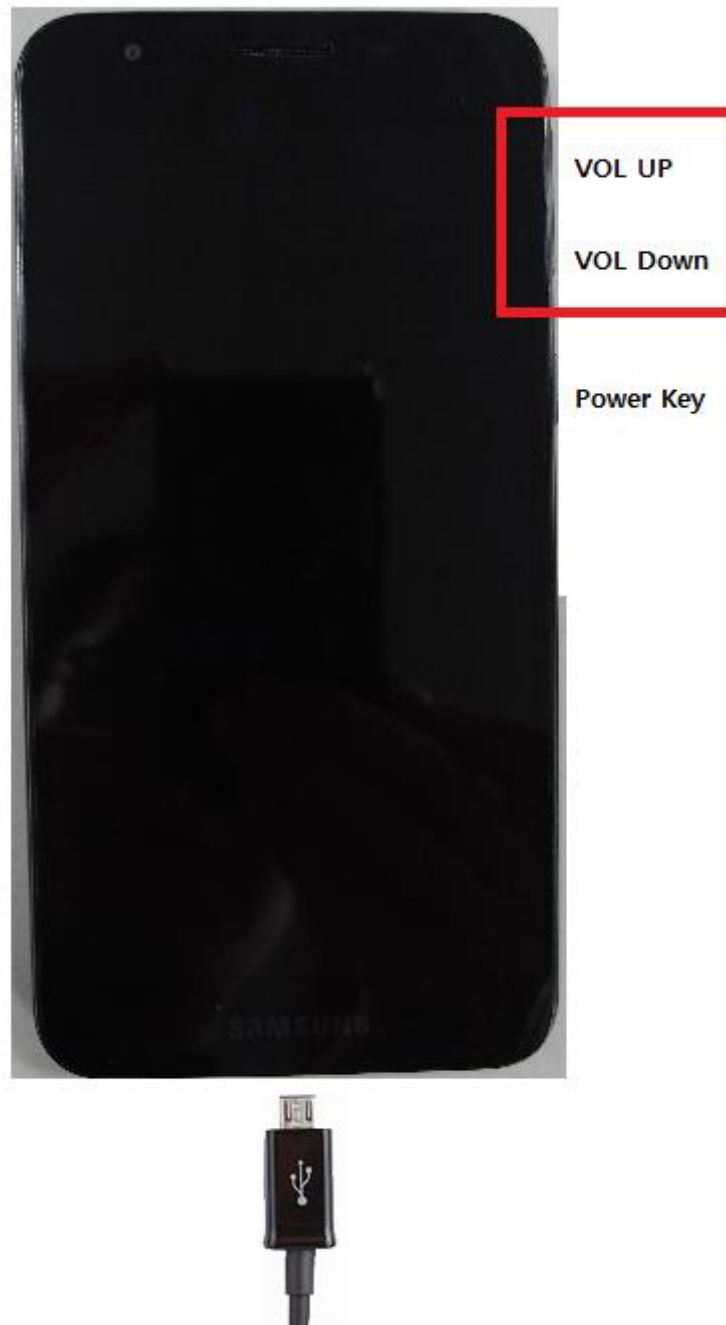
6. Level 1 Repair

3. Connect the device to PC via Data Cable.
Make sure that the one of communication ports [ID:COM] box is highlighted in sky blue.
The device is now connected with the PC and ready to download the binary files in it.
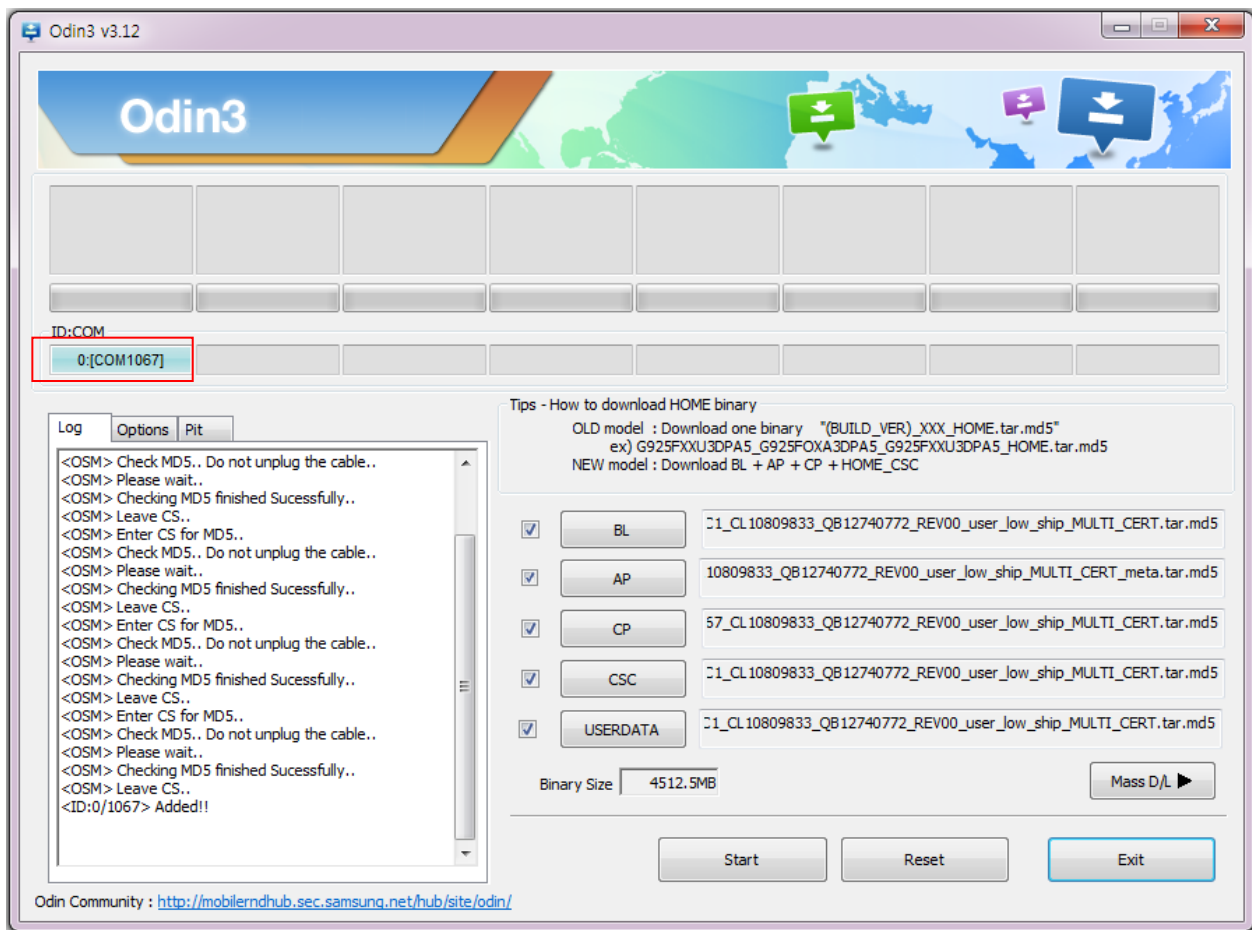
6. Level 1 Repair

4. Start downloading the binary files into the device by clicking Start button on the screen.

The green colored "PASS!" sign will appear on the upper-left box if the binary files have been successfully downloaded into the device.
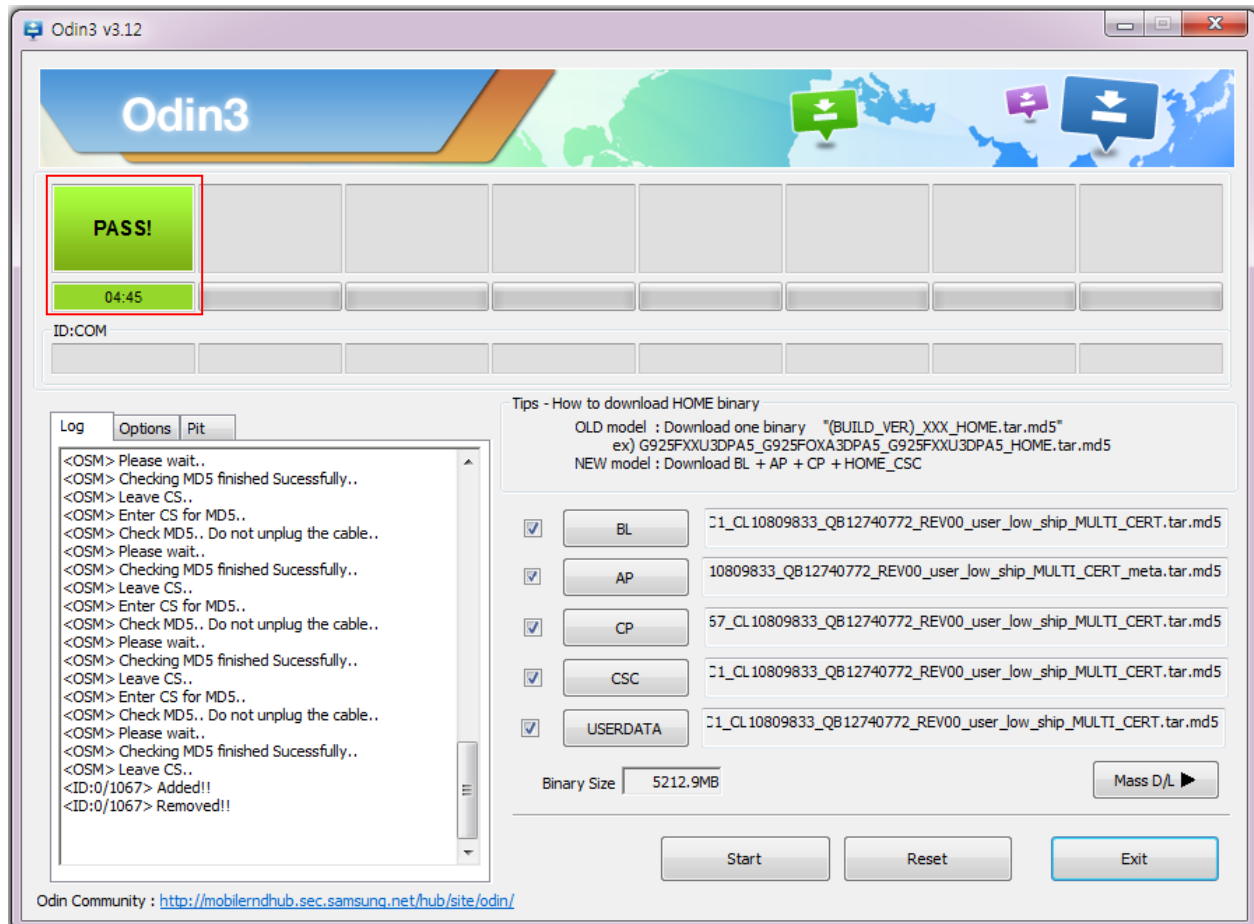
5. Disconnect the device from the Data cable.

6. Once the device boots up, you can check the version of the binary file or name by pressing the following code in sequence; *#1234#

You can perform Factory data Reset by Settings → General Management → Reset

※   **Caution. Never disconnect during the S/W downloading.**

6. Level 1 Repair

6-3. IMEI writing

6-3-1. Preparation

- New IMEI writing Program has been released.
- Supported Model : Models which CAB files are uploaded on HHPsvc INI File category, instead of ini file.
- Refer to below IMEI writing procedure.

- H/W

- S/W

① Library Install	To use Daseul, library files should be installed. Refer to SVC Bulletin "(11-82) Daseul (New IMEI writing Program) Library Install guide_rev1.0"
②Launcher	**DASEUL_SVC_Launcher_v3.0.12** or higher -Uploaded on HHPsvc Notice
③ Runtime File	1. **DASEUL_IMEI_ALL_Runtime_3.1.281.0_r00405.CAB** or higher -Uploaded on HHPsvc Notice 2. Make 'ModelName' folder at the same position with launcher & Runtime file. 📦 DASEUL_IMEI_ALL_Runtime_3.1.281.0_r00405.CAB 📦 DASEUL_Launcher_v4.0.0.exe 📦 SM-G955U_VZW(SIM)_IMEI_Ver_3.1.278.2.CAB
④Model File	Copy Model File under the 'Model Name' folder

6. Level 1 Repair

6-3-2. IMEI writing Process

1. Run DASEUL_SVC_Launcher_v3.0.12.exe DASEUL_SVC_Launcher_v3.0.12.exe
2. Select Service Mode
3. Click [...] and Select folder where the Launcher exists
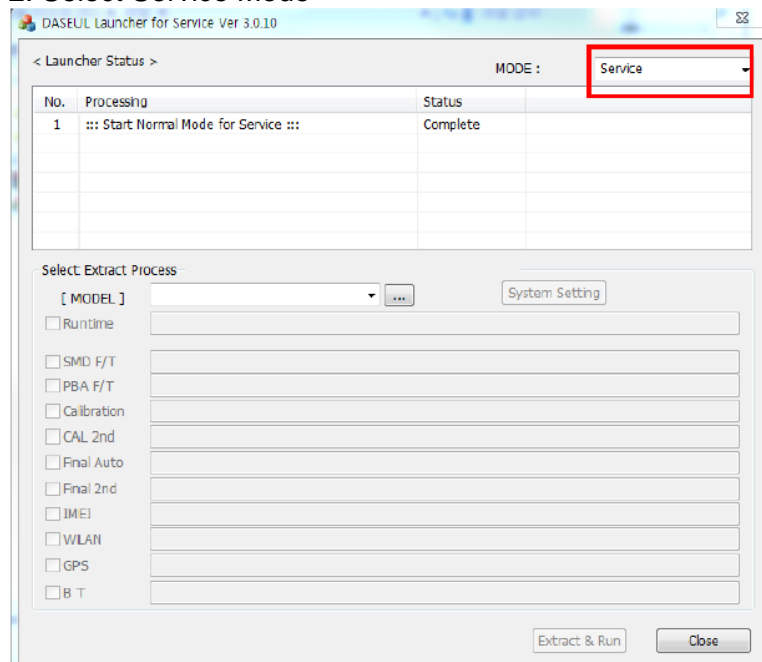
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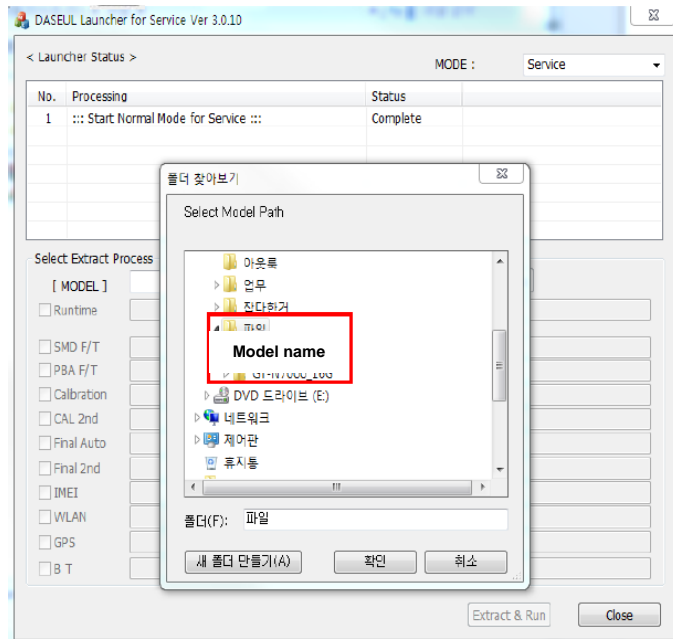
6. Level 1 Repair
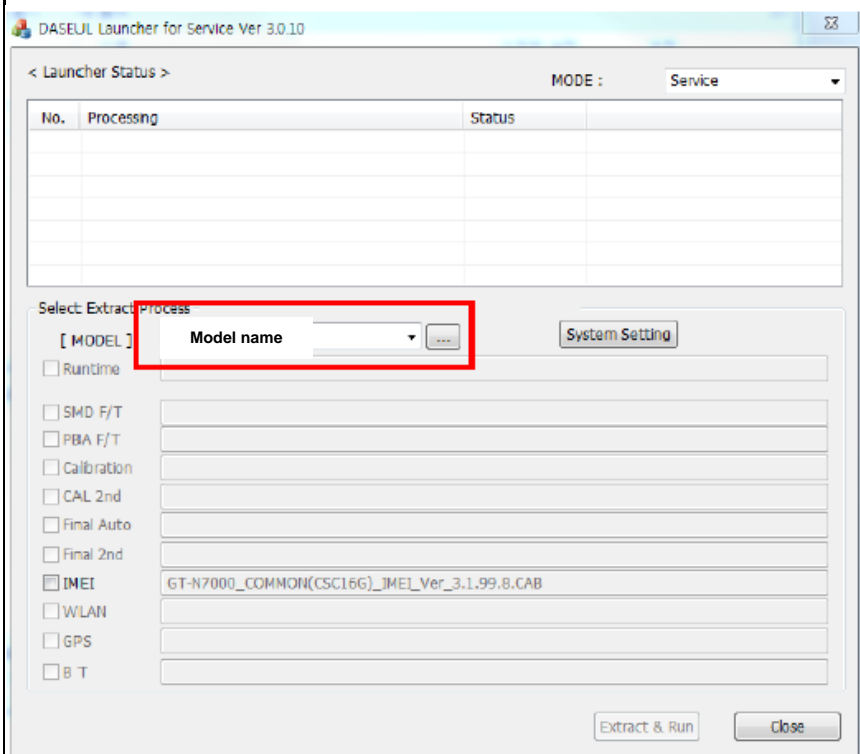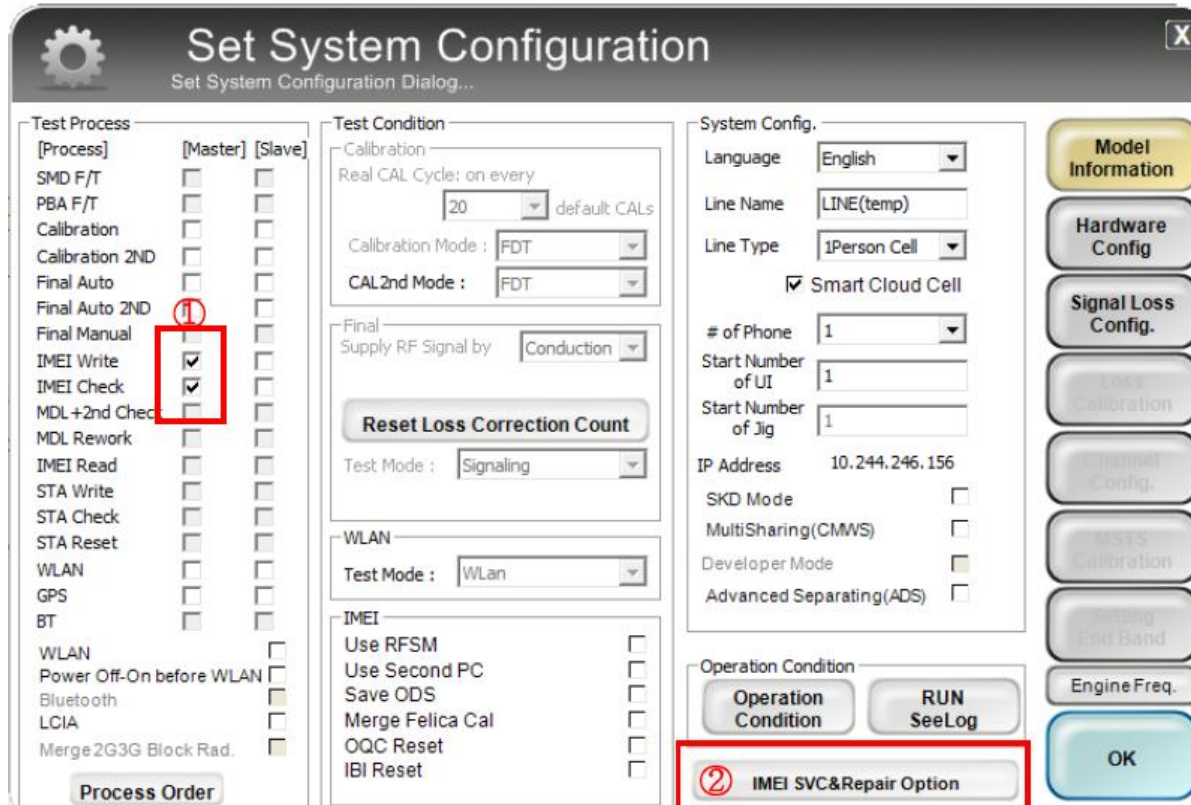
4. Select Model
5. Check IMEI and click System Setting ※Once you setup the setting, you don t have to do it again, unless there is change. From second run of the IMEI program, check IMEI and click Extract & Run.
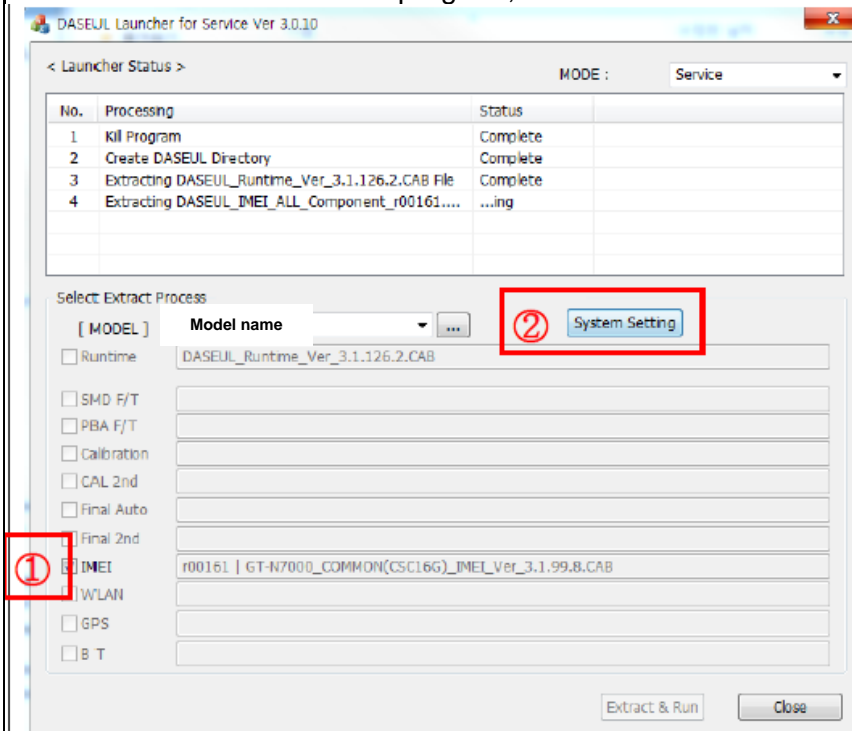
6. Level 1 Repair

6. Check IMEI Write / IMEI Check and click IMEI SVC & Repair Option.

7. Check 'SVC , User Ticket No' and click OK

6. Level 1 Repair

8. Click 'Hardware Config'

9. Click 'Port Setting'

6. Level 1 Repair

10. Select Port Number and SAVE

Set IO BUS Configuration

Phone IO Bus Setting

Common

BaudRate	115200
Data Bit	8
Parity	No
Stop Bit	1

No	Port #1
1	1

SAVE

Cancel

11. Click OK to proceed

Set System Configuration
Set System Configuration Dialog...

Test Process

[Process]	[Master]	[Slave]
SMD F/T	☐	☐
PBA F/T	☐	☐
Calibration	☐	☐
Final Auto	☐	☐
Final Manual	☐	☐

IMEI Process

IMEI Write	☑	☐
IMEI Check	☑	☐
MDL +2nd Check	☐	☐
MDL Rework	☐	☐
IMEI Read	☐	☐

WLAN	☐
Power Off-On before WLAN	☐
Bluetooth	☐

Test Condition

Calibration
Real CAL Cycle: on every
20 default CALs

Calibration Mode : Dynamic

Final
Supply RF Signal by Conduction

Test Signal Mode : Signaling

Developer Mode ☐

IMEI
Use RFSM ☐
Use Second PC ☐
Save ODS ☐

IMEI SVC&Repair Option

System Config.

Language	English
Line Name	LINE(temp)
Line Type	Block Cell
# of Phone	1
Start Number of Jig	1
IP Address	10.244.114.62

Operation Condition

Model Information

Hardware Config

OK

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6. Level 1 Repair

12. Click Model Info and OK when pop-up shows
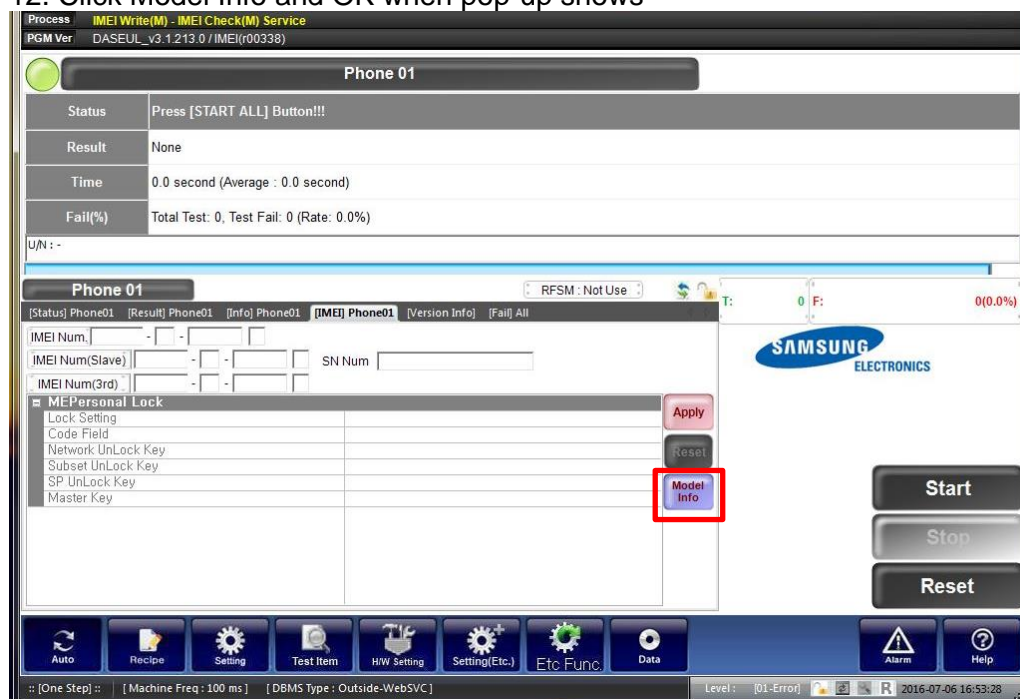
13. Click OK
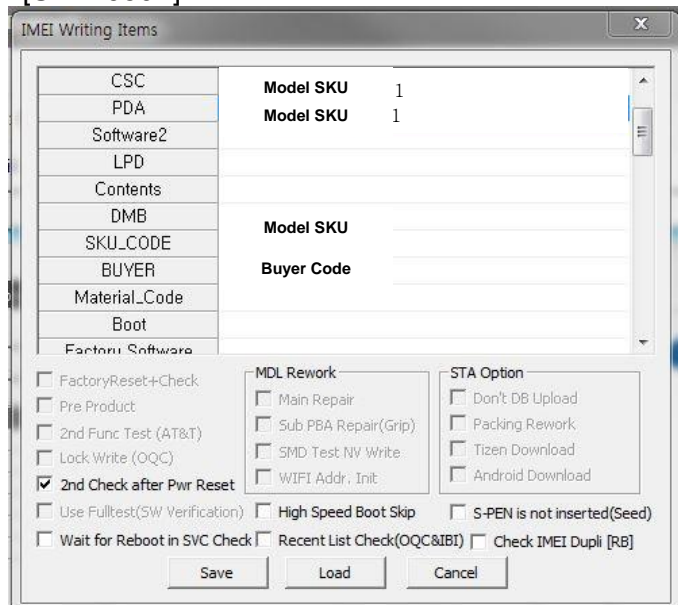
6. Level 1 Repair

14. Input SKU_CODE and BUYER, then click Save button.
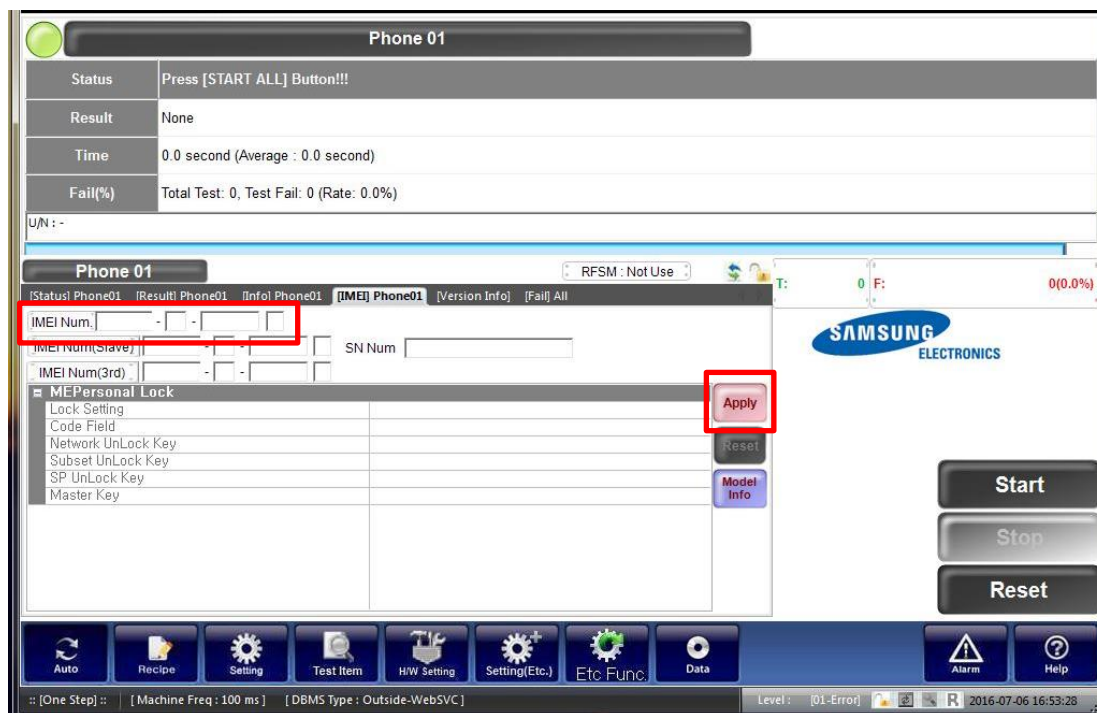
※ Refer to HHPsvc→IMEI Review to check SKU Code and buyer

[SM-N950F]

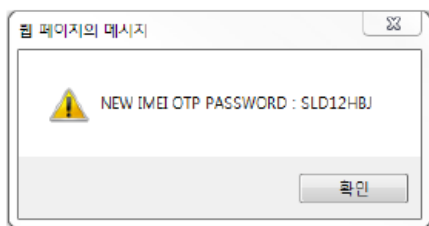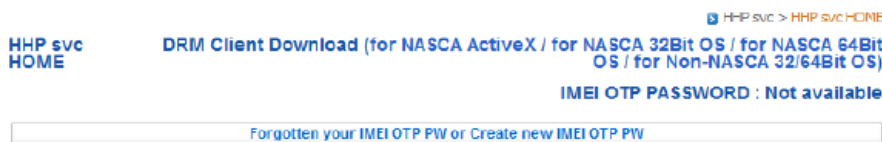15. Input IMEI Number and click Apply

6. Level 1 Repair

16. ① Click Start → ②Input IMEI writing ID and Password & OTP → ③Input Ticket No
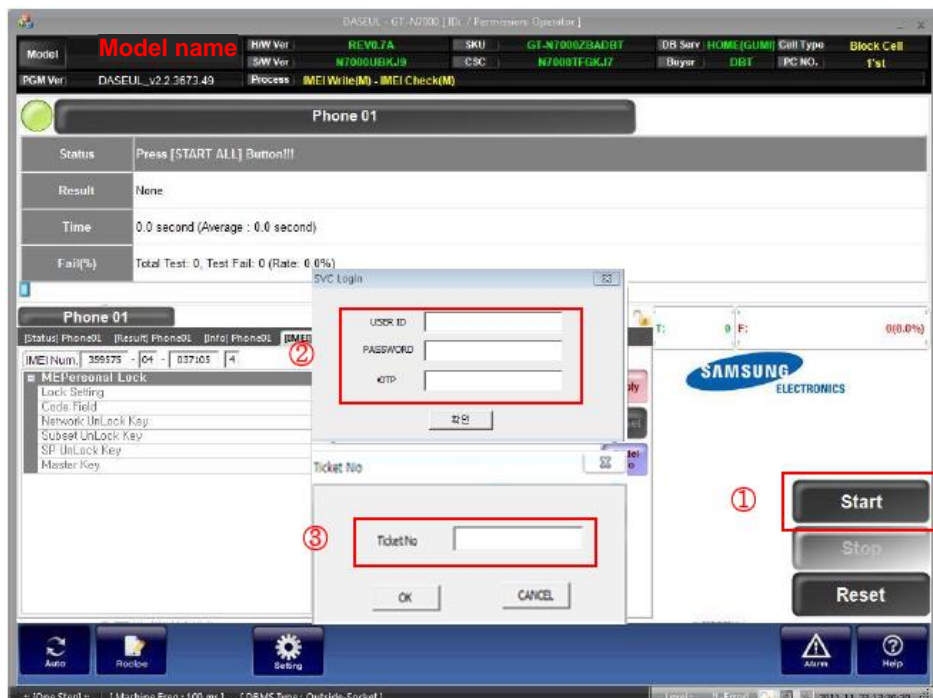
※ OTP(One time Password) : OTP is valid for 6 hours.

After that, you can get new OTP by click the "Forgotten your IMEI OTP PW or Crete new IMEI OTP PW" button.

☞ OTP Location : GSPN → Knowledge → HHP svc → Home

17. Connect the phone to Anyway JIG
※ When you connect the phone, the phone should be turned off.
   After connecting the phone, the phone will be booted automatically.

6. Level 1 Repair

18. IMEI Writing Proceeding

19. IMEI Writing Success
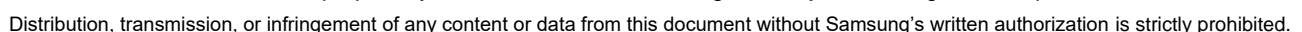
6. Level 1 Repair

6-4. RF Calibration

6-4-1. Required items in order to calibrate RF

• Installation program: RF Calibration Program
- Daseul_Launcher_vx.x.xx.exe
- Daseul_CAL_ALL_Runtime_x.x.xxx.x.CAB
- Model File
: Model Name _OPEN_CALIBRATION_Ver_x.x.xxx.x.CAB

※ **It is required to use the latest program.**

• Mobile Phone
• R&S CMW500
• E3632A Power Supply
• GPIB Cable (2ea)
• JIG BOX (GH81-12520B)
• IF Cable (GH81-11171A)
• Adapter (GH81-11888K)
• UART Serial Cable
• RF Cable (GH81-11962G)

❖ **Table of test cables**

IF Cable	**GH81-11962R**
	7 pin (NEW)
RF Cable (Manual)	**GH81-11962G**
	1.35T, 1750mm

6. Level 1 Repair

❖ **Setting**

Power Supply

GPIB

CMW500

VBAT

JIG BOX

Serial Cable

PC

GH81-11962G
RF CABLE

IF CABLE

GH81-11962R

Phone
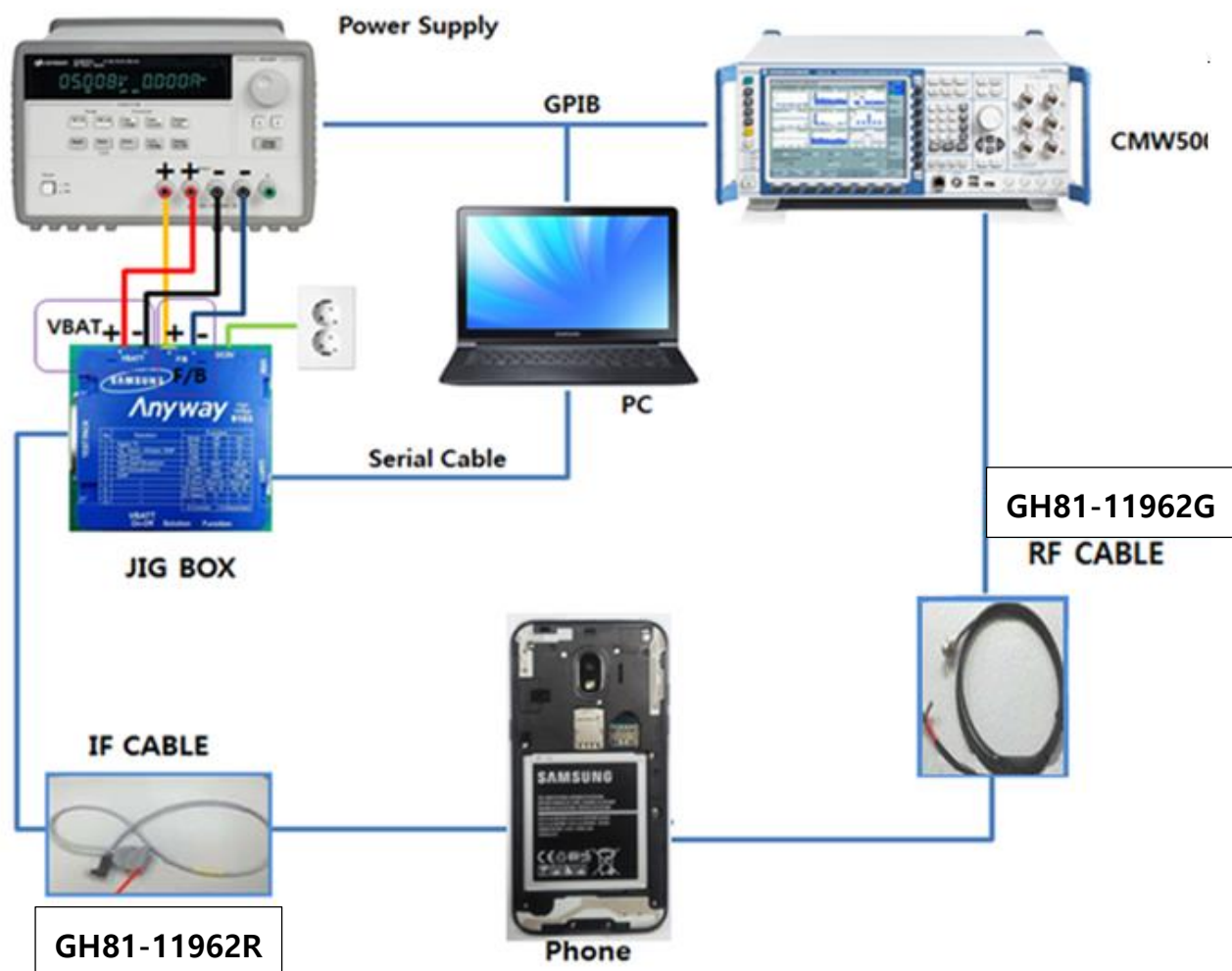
6. Level 1 Repair

6-4-2. RF Calibration Program

1. Run the RF Calibration Program Launcher, 'DASEUL_Launcher_vx.x.xx.exe'.

SM-N950F_OPEN_CALIBRATION_Ver_3.1.316.6
DASEUL_Launcher_v4.0.0
DASEUL_CAL_ALL_Runtime_3.1.316.0_r00538
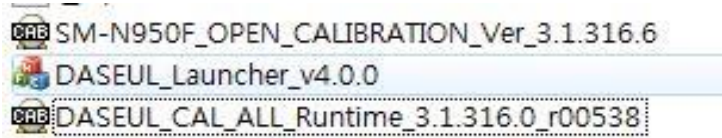
2. Check the 'Calibration' option and Click 'Extract & Run'.

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6. Level 1 Repair

3. Check the 'CAL' and open the model file, then select 'Start' button. [SM-N950F]

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6. Level 1 Repair

4. Change the Line Type to 'Block Cell' and disable 'Smart Cloud Cell'.

6. Level 1 Repair

5. Set the GPIB address of MSTS(CMW500) and Power Supply(E3632A) to enter 'Hardware Config' and 'Save'. (Check the GPIB address of equipments in advance)

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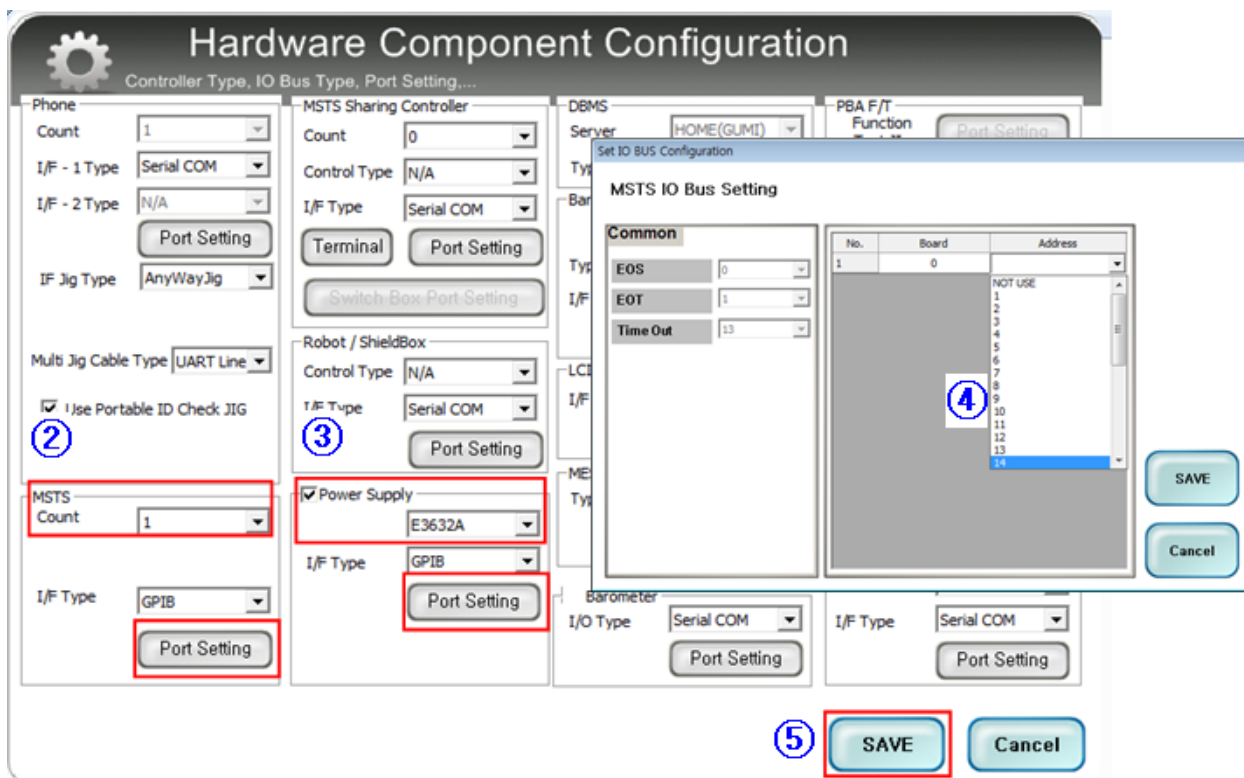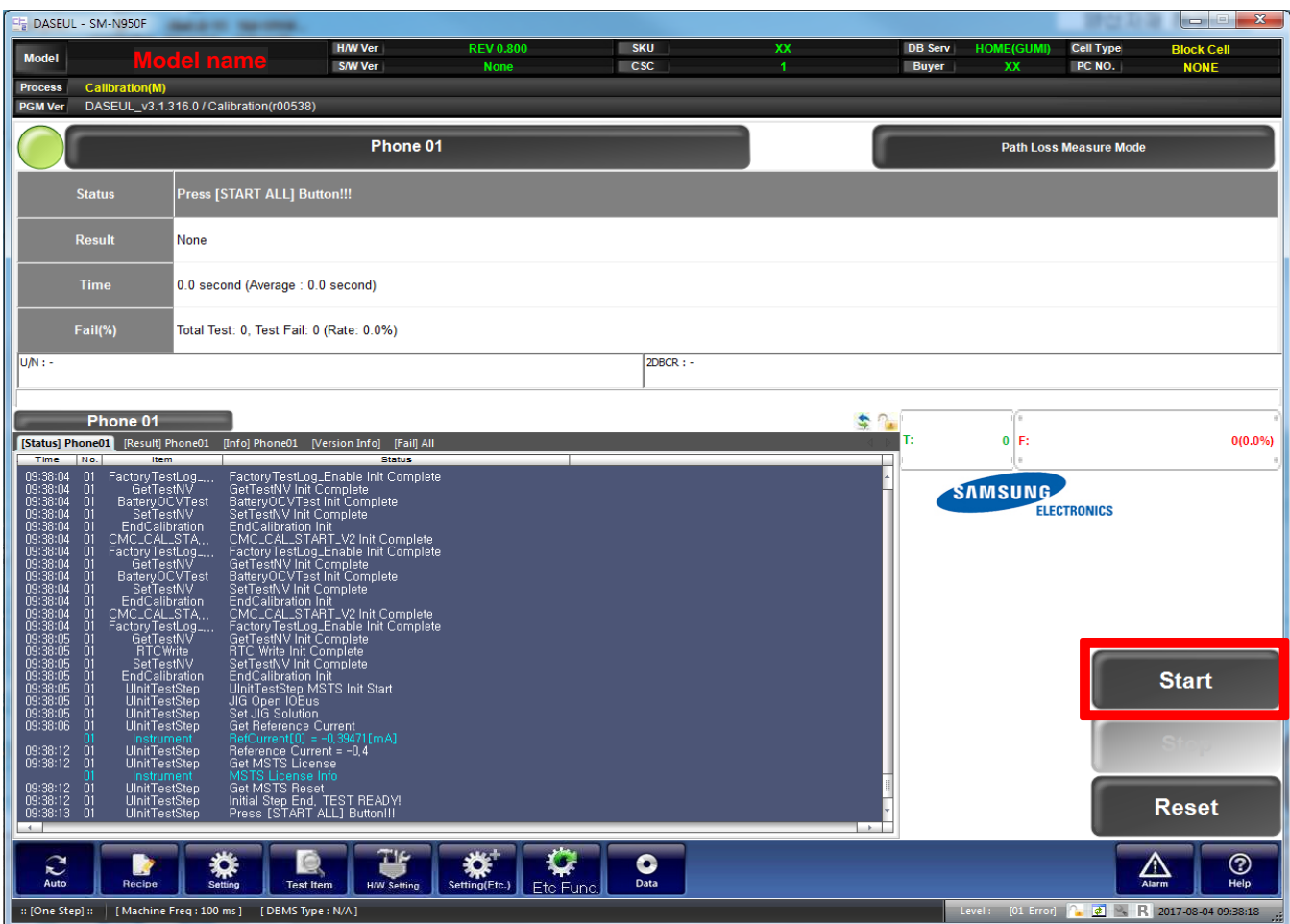
6. Level 1 Repair

6. Press 'OK' to start RF Calibration after completing all settings.

9. Reference Abbreviation

Reference Abbreviation

— **AAC**: Advanced Audio Coding.
— **AVC** : Advanced Video Coding.
— **BER** : Bit Error Rate
— **BPSK**: Binary Phase Shift Keying
— **CA** : Conditional Access
— **CDM** : Code Division Multiplexing
— **C/I** : Carrier to Interference
— **DMB** : Digital Multimedia Broadcasting
— **EN** : European Standard
— **ES** : Elementary Stream
— **ETSI**: European Telecommunications Standards Institute
— **MPEG**: Moving Picture Experts Group
— **PN** : Pseudo-random Noise
— **PS** : Pilot Symbol
— **QPSK**: Quadrature Phase Shift Keying
— **RS** : Reed-Solomon
— **SI** : Service Information
— **TDM** : Time Division Multiplexing
— **TS** : Transport Stream