

2. Specification

2-1. GSM General Specification

	GSM850	EGSM 900	DCS1800	PCS1900	WCDMA 2100	WCDMA 1900	WCDMA 850	WCDMA 900
Freq. Band[MHz] Uplink/ Downlink	824~849 869~894	880~915 925~960	1710~1785 1805~1880	1850~1910 1930~1990	1922~1977 2112~2167	1850~1910 1930~1990	824~849 869~894	880~915 925~960
ARFCN range	128~251	0~124 & 975~1023	512~885	512~810	UL: 9612~9888 DL: 10562~10838	UL: 9262~9538 DL: 9662~9938	UL: 4132~4233 DL: 4357~4458	UL: 2712~2863 DL: 2937~3088
Tx/Rx spacing	45MHz	45MHz	95MHz	80MHz	190MHz	80MHz	45MHz	45MHz
Mod. Bit rate/ Bit Period	270.833 kbps 3.692us	270.833 kbps 3.692us	270.833 kbps 3.692us	270.833 kbps 3.692us	3.84Mcps	3.84Mcps	3.84Mcps	3.84Mcps
Time Slot Period/ Frame Period	576.9us 4.615ms	576.9us 4.615ms	576.9us 4.615ms	576.9us 4.615ms	FrameLength: 10ms Slotlength: 0.667ms	FrameLength: 10ms Slotlength: 0.667ms	FrameLength: 10ms Slotlength: 0.667ms	FrameLength: 10ms Slotlength: 0.667ms
Modulation	0.3GMSK	0.3GMSK	0.3GMSK	0.3GMSK	QPSKHQPSK	QPSKHQPSK	QPSKHQPSK	QPSKHQPSK
MS Power	33dBm~5dBm	33dBm~5dBm	30dBm~0dBm	30dBm~0dBm	24dBm~-50dBm	24dBm~-50dBm	24dBm~-50dBm	24dBm~-50dBm
Power Class	5pcl ~ 19pcl	5pcl ~ 19pcl	0pcl ~ 15pcl	0pcl ~ 15pcl	3(max+24dBm)	3(max+24dBm)	3(max+24dBm)	3(max+24dBm)
Sensitivity	-102dBm	-102dBm	-100dBm	-100dBm	-106.7dBm	-106.7dBm	-106.7dBm	-106.7dBm
TDMA Mux	8	8	8	8	8	8	8	8
Cell Radius	35Km	35Km	2Km	2Km	2Km	2Km	2Km	2Km

2-2. GSM Tx Power Class

TX Power control level	GSM850	TX Power control level	EGSM900	TX Power control level	DCS1800	TX Power control level	PCS1900
5	33±2 dBm	5	33±2 dBm	0	30±3 dBm	0	30±3 dBm
6	31±2 dBm	6	31±2 dBm	1	28±3 dBm	1	28±3 dBm
7	29±2 dBm	7	29±2 dBm	2	26±3 dBm	2	26±3 dBm
8	27±2 dBm	8	27±2 dBm	3	24±3 dBm	3	24±3 dBm
9	25±2 dBm	9	25±2 dBm	4	22±3 dBm	4	22±3 dBm
10	23±2 dBm	10	23±2 dBm	5	20±3 dBm	5	20±3 dBm
11	21±2 dBm	11	21±2 dBm	6	18±3 dBm	6	18±3 dBm
12	19±2 dBm	12	19±2 dBm	7	16±3 dBm	7	16±3 dBm
13	17±2 dBm	13	17±2 dBm	8	14±3 dBm	8	14±3 dBm
14	15±2 dBm	14	15±2 dBm	9	12±4 dBm	9	12±4 dBm
15	13±2 dBm	15	13±2 dBm	10	10±4 dBm	10	10±4 dBm
16	11±3 dBm	16	11±3 dBm	11	8±4 dBm	11	8±4 dBm
17	9±3dBm	17	9±3dBm	12	6±4 dBm	12	6±4 dBm
18	7±3 dBm	18	7±3 dBm	13	4±4 dBm	13	4±4 dBm
19	5±3 dBm	19	5±3 dBm	14	2±5 dBm	14	2±5 dBm
				15	0±5 dBm	15	0±5 dBm

3. Operation Instruction and Installation

Main Function

Item	Description
OS	Android V5.1.1 (Lollipop)
RF	2G Quad (850/900/1800/1900) 3G Quad (2100/1900/850/900)
Battery	2,600mAh
Base Band	1.3GHZ, Quad-Core
Other RF	A-GPS / BT 4.0 / USB v2.0 / WiFi (802.11 b/g/n)
Camera	8.0 MP Main CAM + 5 MP Sub CAM
LCD	5.0" qHDLCD, 540 x 960
RAM	1GB
Sensor	Sensors: Accelerometer, Magnetic, Proximity
Accessory	Charger: 5V/1A Data cable: 2.7pi, 1.2m Ear phone: 3.5pi, 4pin

9. Reference Abbreviate

Reference Abbreviate

- **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

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.

1-2. 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.

6. Level 1 Repair

6-1. S/W installation

6-1-1. Required items in order to install S/W

- Installation program: Downloader Program (**Odin3 v3.10.5.exe**)
- Mobile Phone
- Data Cable
- Mobile device specific S/W: Binary files

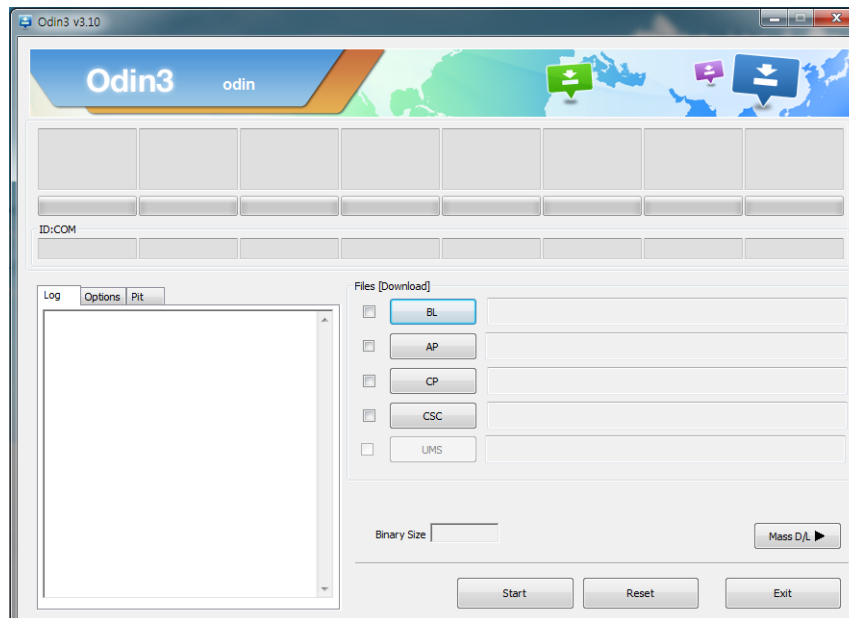
※ Settings



Data Cable : GH39-01681A

6-1-2. S/W Installation Program (Downloader program)

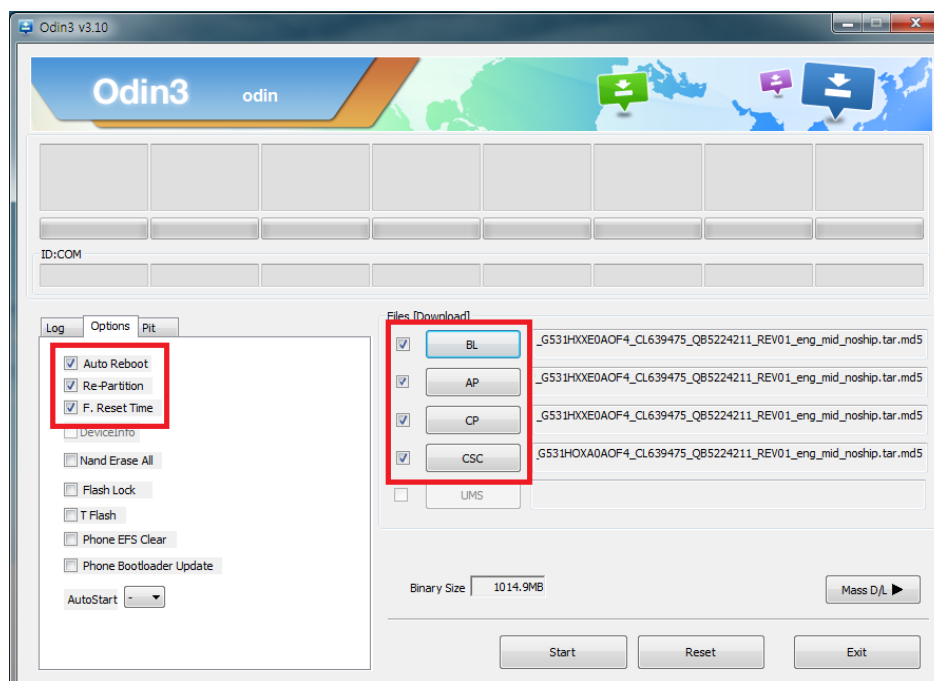
- Open up the S/W Installation Program by executing the **"Odin3 v3.10.5.exe"**



("odin3.ini" file should be in the same folder with odin3 v3.10.5.exe)

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

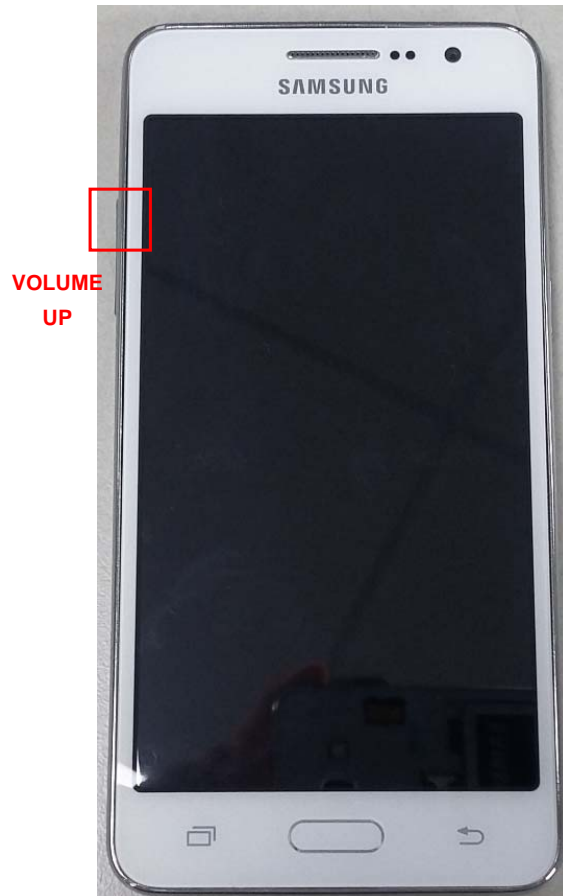
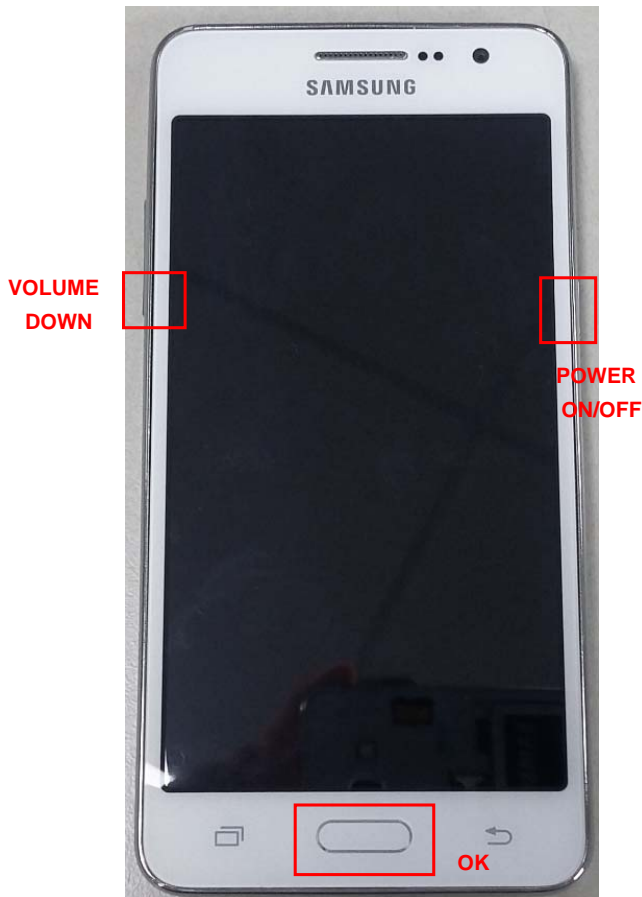
- Check Auto Reboot and F. Reset Time
- Check BL, AP, CP, and CSC Files



2. Enter into Download Mode

1. Press Volume Down button, OK button, and ON/OFF Button simultaneously.

2. After confirm the warning message, Volume UP button press to enter download mode.

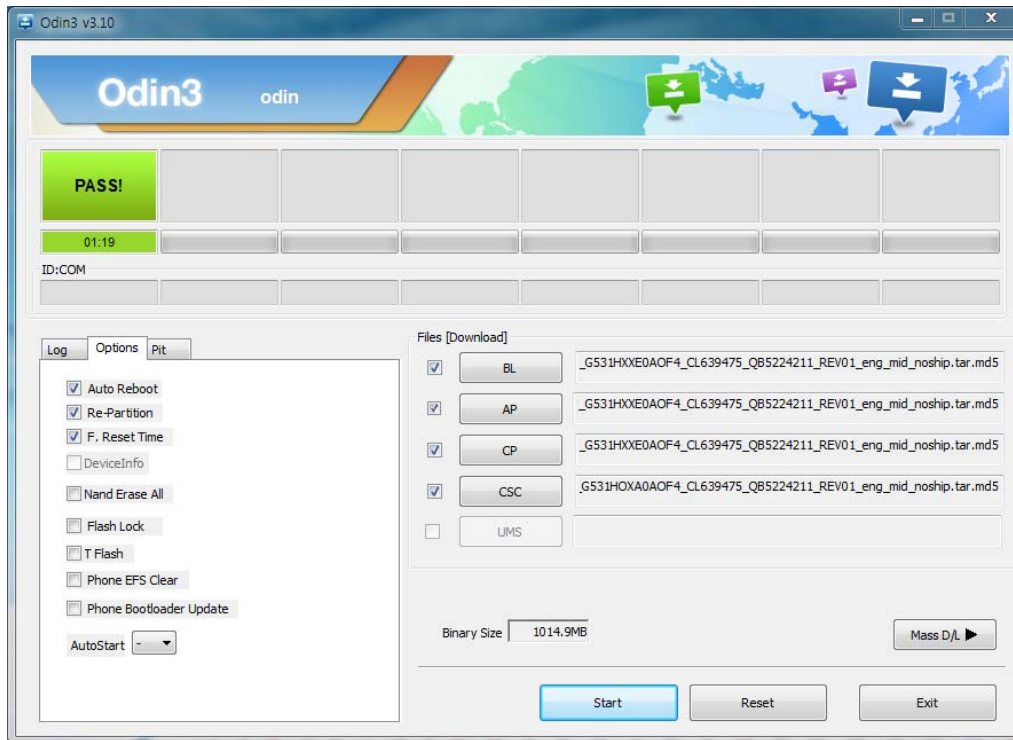


3. Connect the device to PC via Data Cable.

Make sure that the one of communication port [ID:COM] box is pop-up.
The device is now connected with the PC and ready to download the binary file into the device.

4. Start downloading binary file 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 file has 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#**

Full Reset :

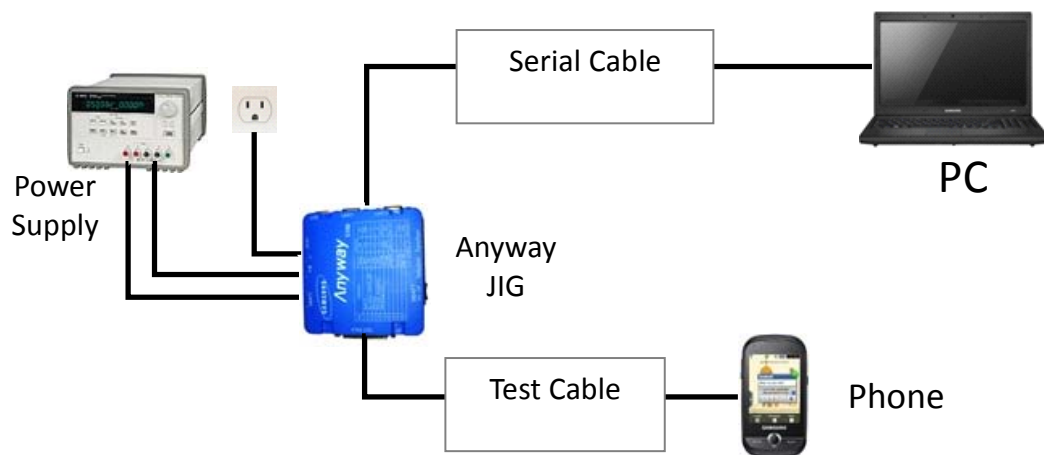
Apps > Settings > Backup and reset > Factory data reset

6-2 IMEI writing

6-2-1 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

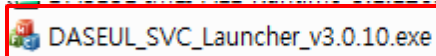


- S/W

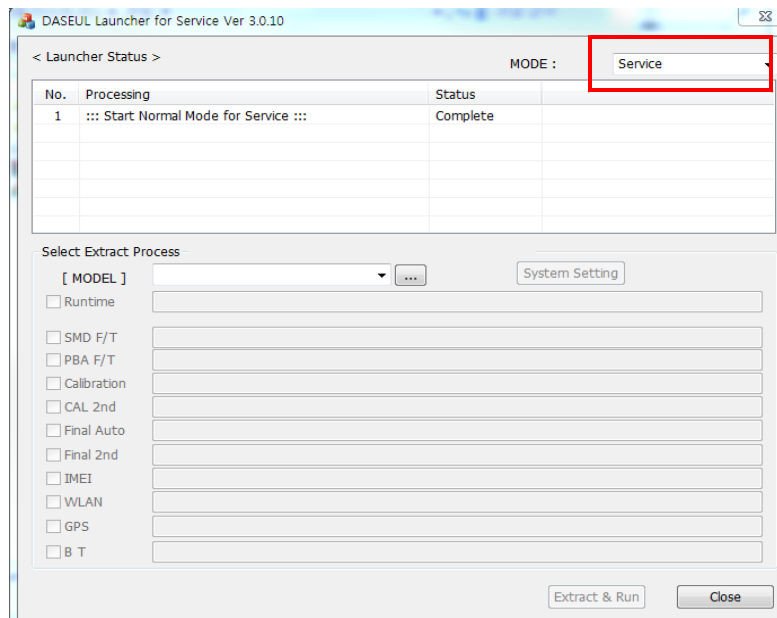
① Library Install	To use Daseul, library files should be installed. Refer to SVC Bulletin “(11-82) Daseul (New IMEI writing Program) Library Install guide_rev1.0”
② Launcher	DASEUL_SVC_Launcher_v3_0_10 or higher -Uploaded on HHPsvc Notice
③ Runtime File	1. DASEUL_IMEI_ALL_Runtime_129_r00165 .CAB or higher -Uploaded on HHPsvc Notice 2. Make 'ModelName' folder at the same position with launcher & Runtime file.
④ Model File	Copy Model File under the 'Model Name' folder

6-2-2 IMEI writing Process

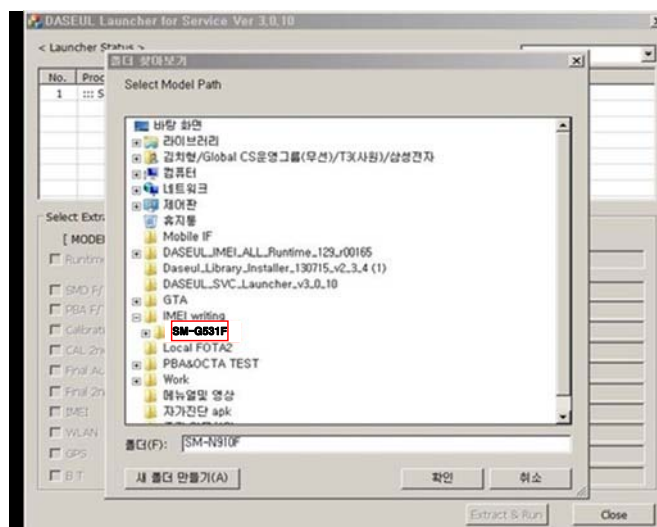
1. Run DASEUL_SVC_Launcher_v3.0.10.exe



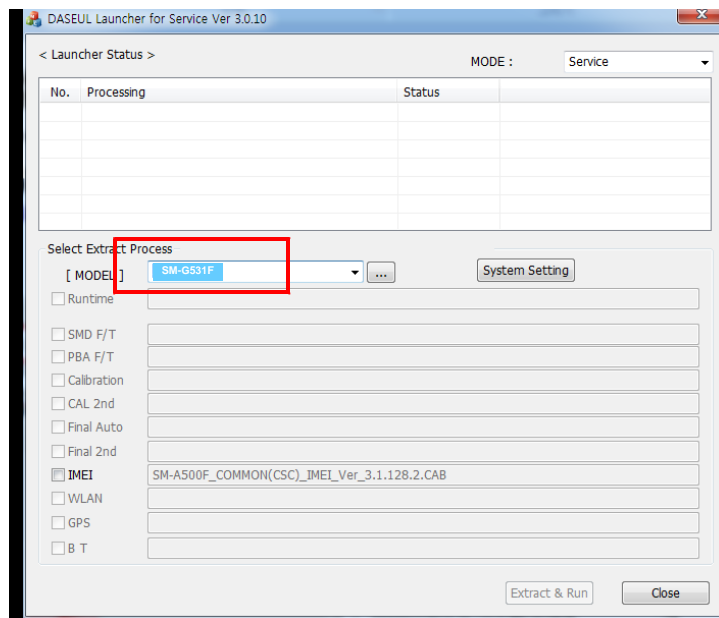
2. Select Service Mode



3. Click [Select Model Path] and Select folder where the Launcher exists

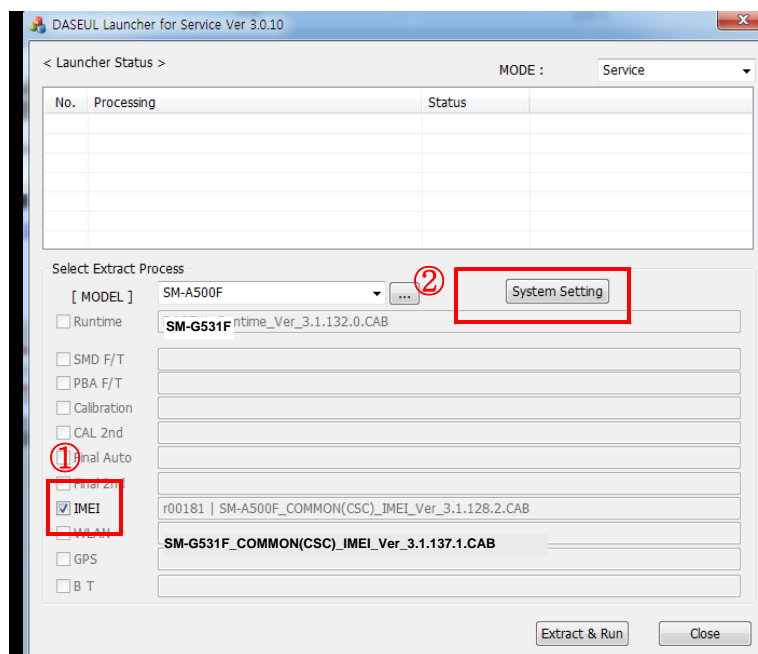


4. Select Model

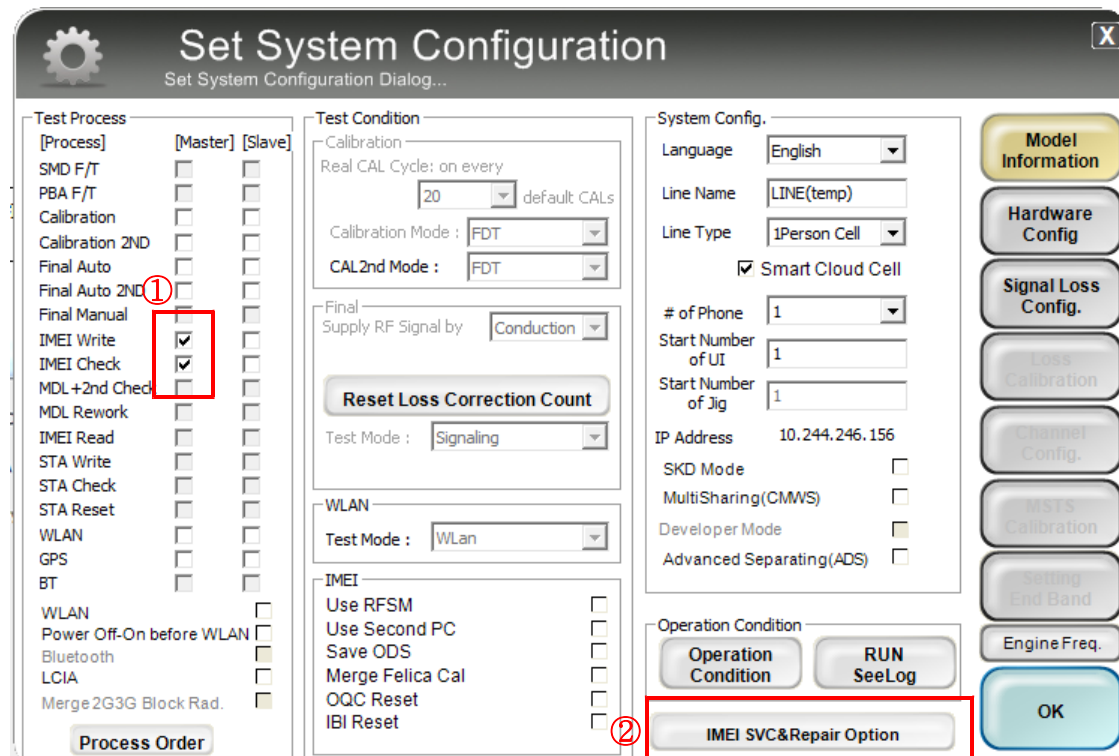


5. Check IMEI and click 'System Setting'

※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. Check 'IMEI Write / IMEI Check', and click 'IMEI SVC & Repair Option'



Set System Configuration
Set System Configuration Dialog...

Test Process

[Process]	[Master]	[Slave]
SMD F/T	<input type="checkbox"/>	<input type="checkbox"/>
PBA F/T	<input type="checkbox"/>	<input type="checkbox"/>
Calibration	<input type="checkbox"/>	<input type="checkbox"/>
Calibration 2ND	<input type="checkbox"/>	<input type="checkbox"/>
Final Auto	<input type="checkbox"/>	<input type="checkbox"/>
Final Auto 2ND	<input type="checkbox"/>	<input type="checkbox"/>
Final Manual	<input type="checkbox"/>	<input type="checkbox"/>
IMEI Write	<input checked="" type="checkbox"/>	<input type="checkbox"/>
IMEI Check	<input checked="" type="checkbox"/>	<input type="checkbox"/>
MDL +2nd Check	<input type="checkbox"/>	<input type="checkbox"/>
MDL Rework	<input type="checkbox"/>	<input type="checkbox"/>
IMEI Read	<input type="checkbox"/>	<input type="checkbox"/>
STA Write	<input type="checkbox"/>	<input type="checkbox"/>
STA Check	<input type="checkbox"/>	<input type="checkbox"/>
STA Reset	<input type="checkbox"/>	<input type="checkbox"/>
WLAN	<input type="checkbox"/>	<input type="checkbox"/>
GPS	<input type="checkbox"/>	<input type="checkbox"/>
BT	<input type="checkbox"/>	<input type="checkbox"/>
WLAN	<input type="checkbox"/>	<input type="checkbox"/>
Power Off-On before WLAN	<input type="checkbox"/>	<input type="checkbox"/>
Bluetooth	<input type="checkbox"/>	<input type="checkbox"/>
LCIA	<input type="checkbox"/>	<input type="checkbox"/>
Merge 2G3G Block Rad.	<input type="checkbox"/>	<input type="checkbox"/>

Test Condition

Calibration
Real CAL Cycle: on every default CALs

Calibration Mode :

CAL2nd Mode :

Final
Supply RF Signal by

Reset Loss Correction Count

Test Mode :

WLAN
Test Mode :

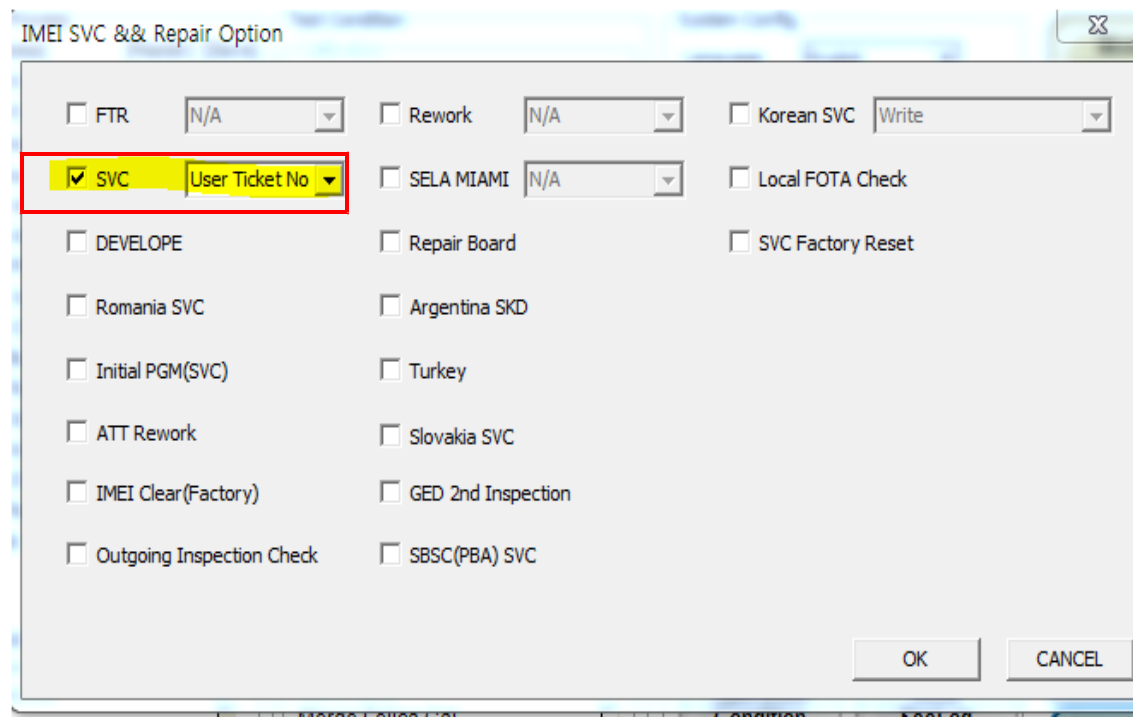
IMEI
☐ Use RFSM
☐ Use Second PC
☐ Save ODS
☐ Merge Felica Cal
☐ OQC Reset
☐ IBI Reset

System Config.
 Language
 Line Name
 Line Type
☒ Smart Cloud Cell
 # of Phone
 Start Number of UI
 Start Number of Jig
 IP Address
 SKD Mode ☐
 MultiSharing(CMWS) ☐
 Developer Mode ☐
 Advanced Separating(ADS) ☐

Operation Condition

Model Information

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



IMEI SVC & Repair Option

☐ FTR
☐ Rework
☐ Korean SVC

☒ SVC
☐ SELA MIAMI
☐ Local FOTA Check

☐ DEVELOPE
 ☐ Repair Board
 ☐ SVC Factory Reset

☐ Romania SVC
 ☐ Argentina SKD

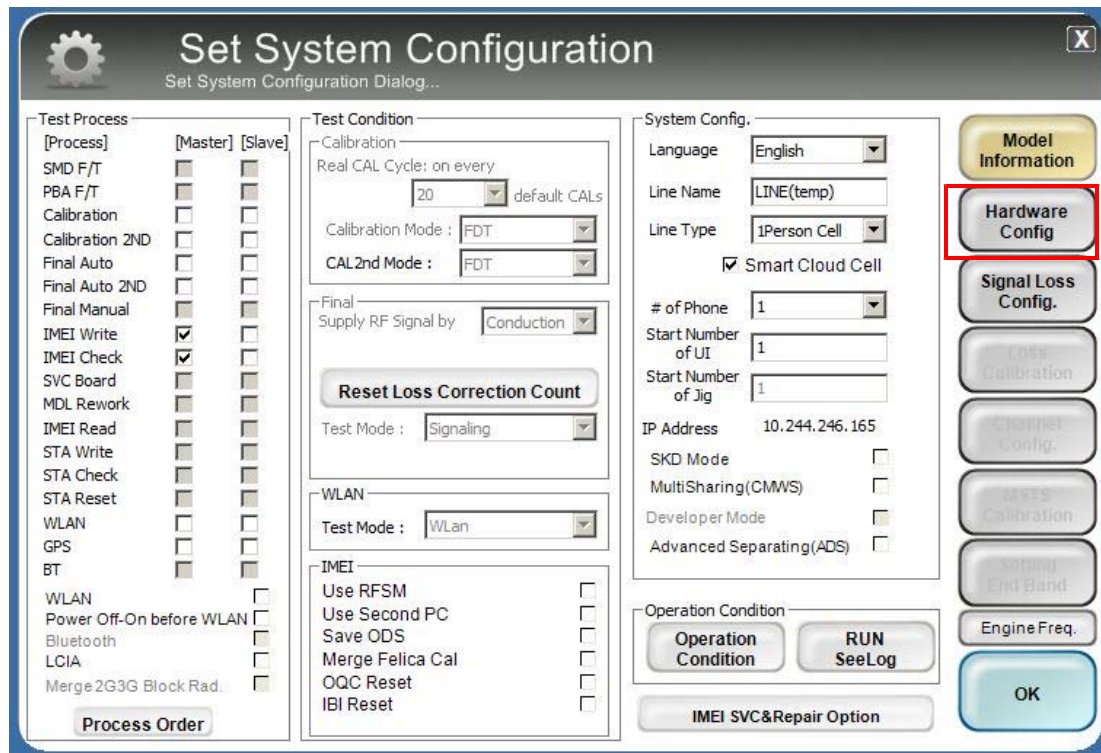
☐ Initial PGM(SVC)
 ☐ Turkey

☐ ATT Rework
 ☐ Slovakia SVC

☐ IMEI Clear(Factory)
 ☐ GED 2nd Inspection

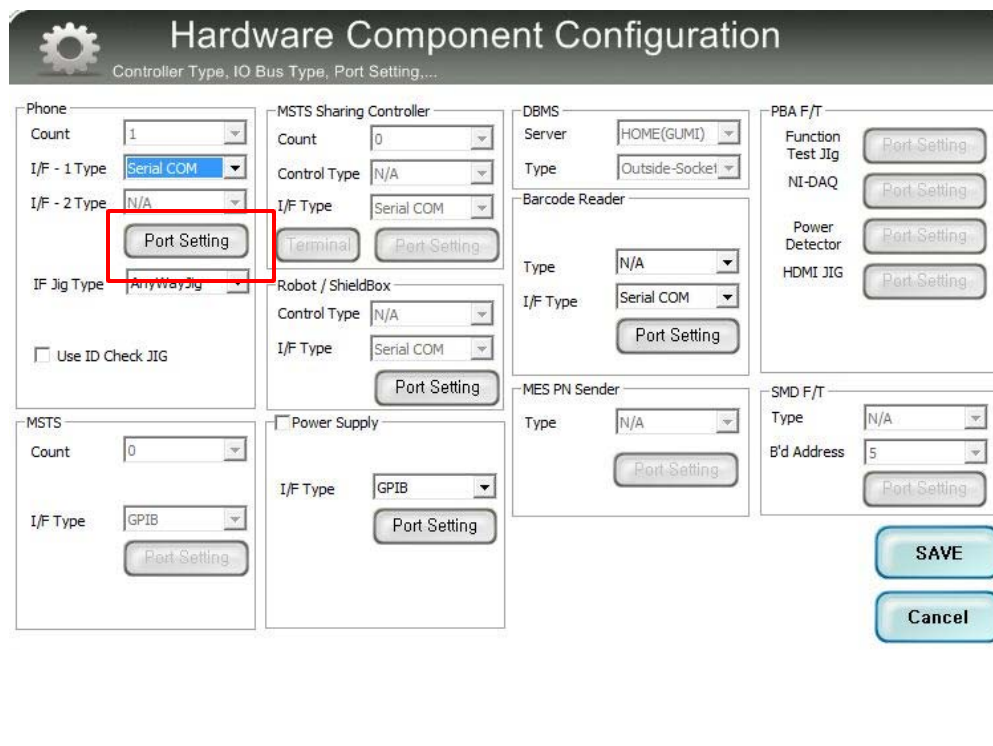
☐ Outgoing Inspection Check
 ☐ SBSC(PBA) SVC

8. Click 'Hardware Config'



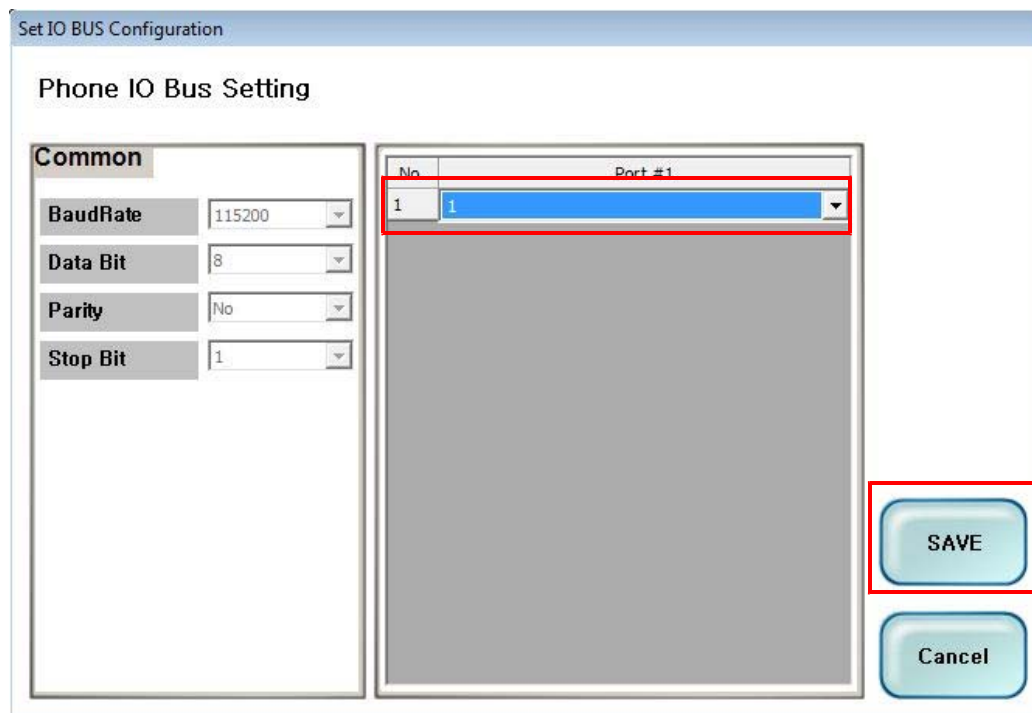
The 'Set System Configuration' dialog box is shown. The 'Hardware Config' button is highlighted with a red rectangle. The dialog is divided into several sections: 'Test Process' with checkboxes for various tests; 'Test Condition' with dropdowns for calibration and test modes; 'System Config.' with fields for language, line name, and IP address; and a vertical sidebar on the right with buttons for 'Model Information', 'Hardware Config', 'Signal Loss Config.', 'Loss Calibration', 'Channel Config.', 'MSTC Calibration', 'Setting End Band', and 'Engine Freq.'. At the bottom are 'Operation Condition', 'RUN SeeLog', and 'IMEI SVC&Repair Option' buttons.

9. Click 'Port Setting'



The 'Hardware Component Configuration' dialog box is shown. The 'Port Setting' button for the 'I/F - 1 Type' is highlighted with a red rectangle. The dialog is divided into several sections: 'Phone' with fields for count and I/F types; 'MSTS Sharing Controller' with fields for count, control type, and I/F type; 'DBMS' with fields for server and type; 'Barcode Reader' with fields for type and I/F type; 'MES PN Sender' with fields for type and I/F type; 'SMD F/T' with fields for type and B'd address; and 'Power Supply' with fields for I/F type. Each section has a 'Port Setting' button. At the bottom are 'SAVE' and 'Cancel' buttons.

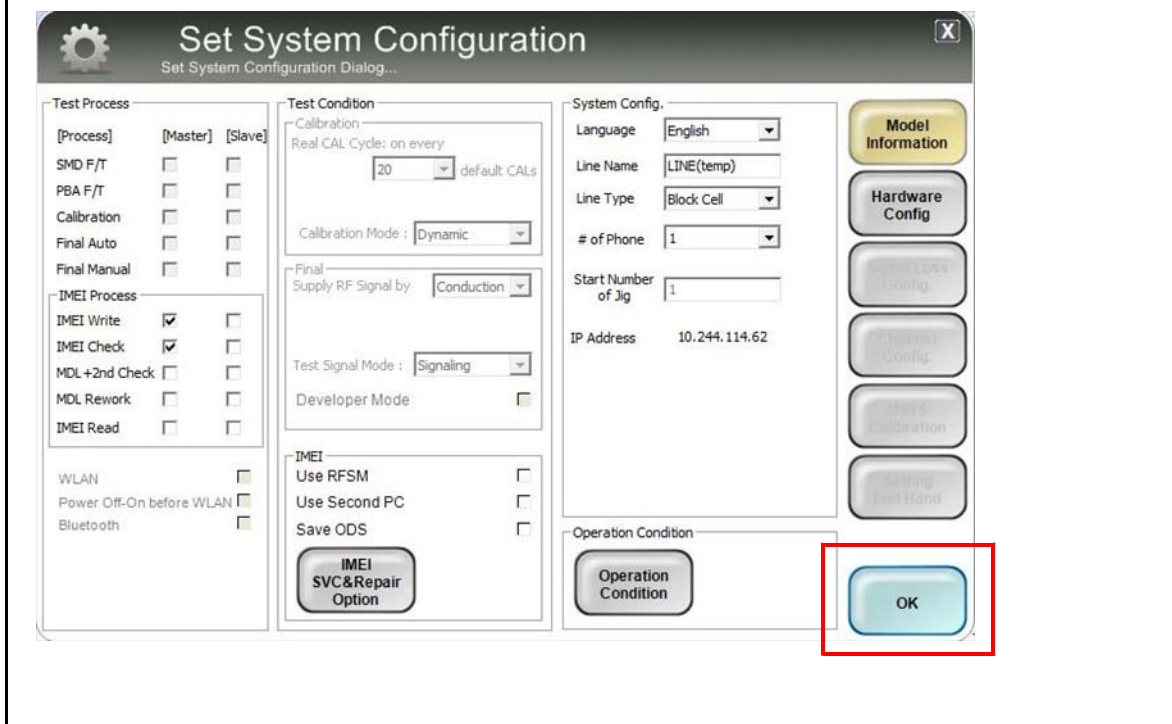
10. Select Port Number and SAVE



The 'Set IO BUS Configuration' dialog box is shown. It has a title bar 'Set IO BUS Configuration' and a subtitle 'Phone IO Bus Setting'. On the left, under the 'Common' tab, there are four settings: BaudRate (115200), Data Bit (8), Parity (No), and Stop Bit (1). On the right, there is a table with two columns: 'No.' and 'Port #1'. The first row has '1' in the 'No.' column and '1' in the 'Port #1' column. A red box highlights the 'Port #1' column header and the first row. Below the table, there are two buttons: 'SAVE' and 'Cancel'. A red box highlights the 'SAVE' button.

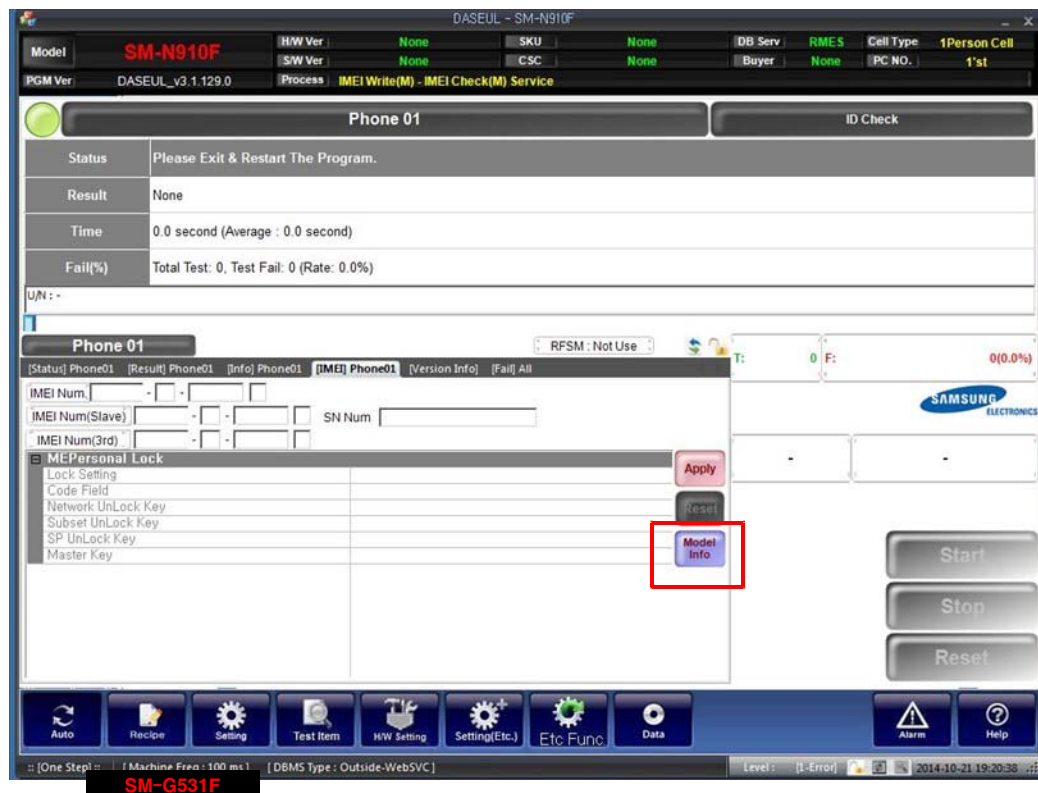
No.	Port #1
1	1

11. Click OK to proceed



The 'Set System Configuration' dialog box is shown. It has a title bar 'Set System Configuration' and a subtitle 'Set System Configuration Dialog...'. The dialog is divided into several sections: 'Test Process' (with checkboxes for SMD F/T, PBA F/T, Calibration, Final Auto, Final Manual, IMEI Write, IMEI Check, MDL +2nd Check, MDL Rework, IMEI Read, WLAN, Power Off-On before WLAN, and Bluetooth), 'Test Condition' (with a 'Real CAL Cycle: on every' dropdown set to 20, 'Calibration Mode' set to Dynamic, 'Final Supply RF Signal by' set to Conduction, 'Test Signal Mode' set to Signaling, and 'Developer Mode' checkbox), 'System Config.' (with 'Language' set to English, 'Line Name' set to LINE(temp), 'Line Type' set to Block Cell, '# of Phone' set to 1, 'Start Number of Jig' set to 1, and 'IP Address' set to 10.244.114.62), and 'Operation Condition' (with 'IMEI SVC&Repair Option' and 'Operation Condition' buttons). On the right side, there are several buttons: 'Model Information', 'Hardware Config', 'Smart Loss Config', 'Channel Config', 'Mass Calibration', and 'Setting Test Band'. A red box highlights the 'OK' button at the bottom right.

12. Click Model Info and OK when pop-up shows



13. Click OK



14. Input SKU_CODE and BUYER, then click Save button.

※ Refer to HHPsvc→IMEI Review to check SKU Code and buyer

CSC	G531FSER0AOE8
PDA	G531FXXU0AOE8
Software2	
LPD	
Contents	
DMB	
SKU_CODE	SM-G531FXXXSER
BUYER	SER
Material_Code	
Boot	

Factory Software

☐ FactoryReset+Check
☐ Pre Product
☐ 2nd Func Test (AT&T)
☐ Lock Write (OQC)
☐ 2nd Check after Pwr Reset

MDL Rework

☐ Main Repair
☐ SMD Test NV Write

STA Option

☐ Don't DB Upload
☐ Packing Rework
☐ Tizen Download
☐ Android Download

Buttons: Save, Load, Cancel

15. Input IMEI Number and click Apply

Phone 01

Status	Wait End of Prior Test.
Result	None
Time	0.0 second (Average : 0.0 second)
Fail(%)	Total Test: 0, Test Fail: 0 (Rate: 0.0%)

UN: -

Phone 01

RFSM: Not Use

IMEI Num: 359973 - 06 - 013273 4

IMEI Num(Stave): 359974 - 06 - 013273 2

IMEI Num(3rd): - - -

SN Num:

MEPersonal Lock

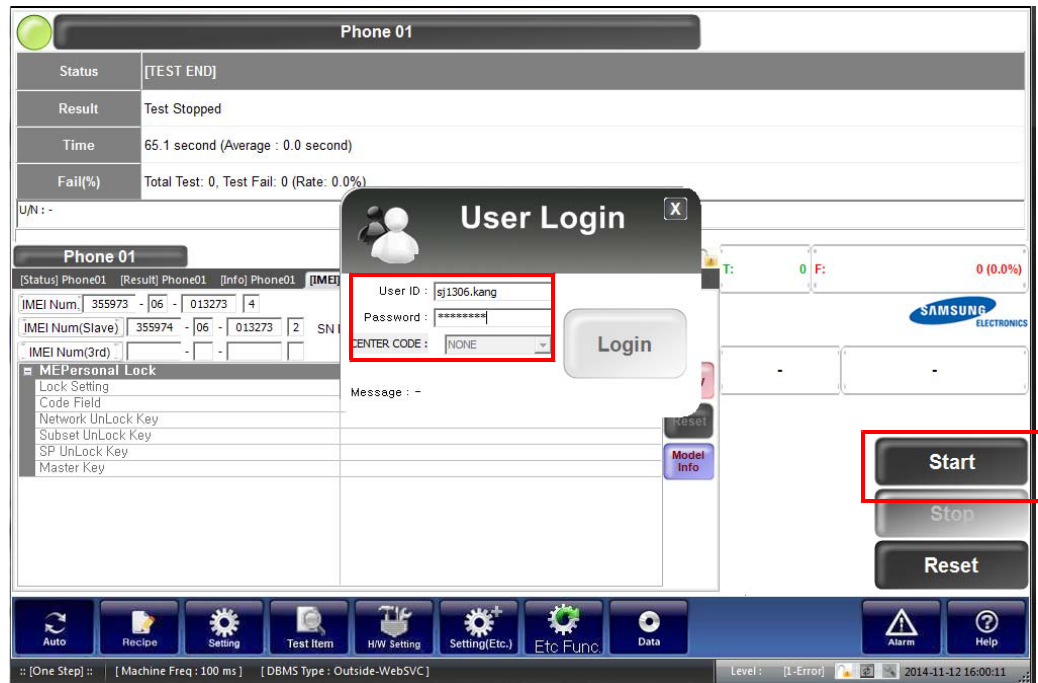
Lock Setting
Code Field
Network UnLock Key
Subset UnLock Key
SP UnLock Key
Master Key

Buttons: Apply, Reset, Model Info, Start, Stop, Pause

Bottom Bar: Auto, Recipe, Setting, Test Item, HW Setting, Setting(Etc.), Etc Func, Data, Alarm, Help

Level: 1-Error 2014-11-12 15:58:16

16. ① Click Start, and input IMEI writing ID and Password → ② input Ticket No

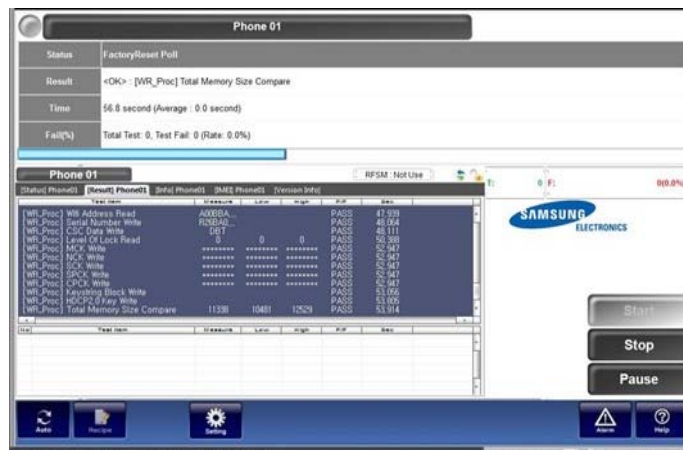


17. Connect the phone to Anyway JIG

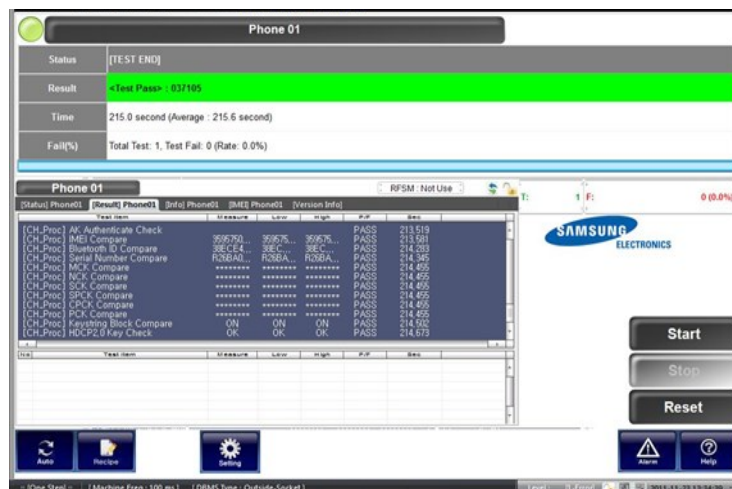
※ When you connect the phone, the phone should be turned off.

After connecting the phone, the phone will be booted automatically.

- ## 18. IMEI Writing Proceeding



19. IMEI Writing Success



6-4. RF Calibration

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

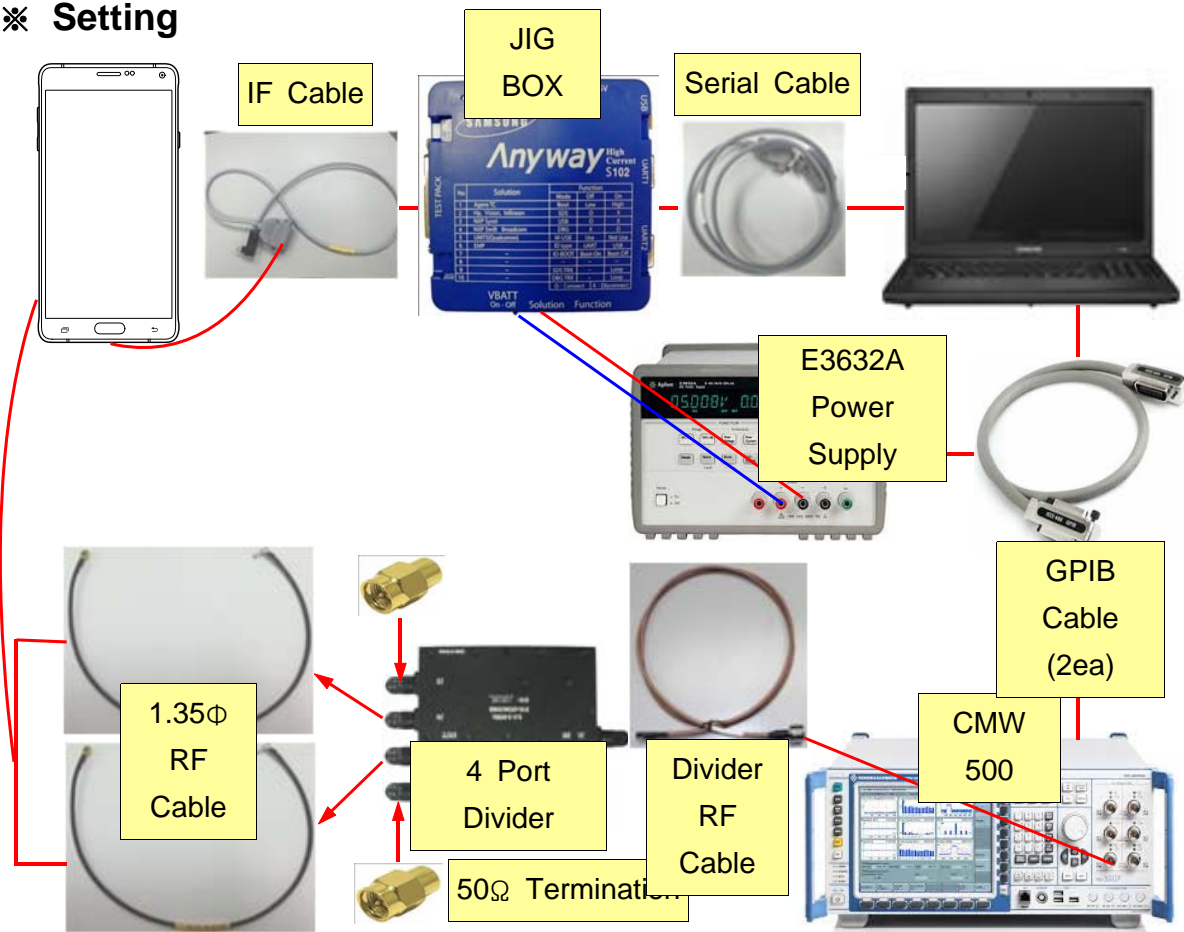
- Installation program: RF Calibration Program
 - Daseul_Launcher_vx.x.xx.exe
 - Daseul_CAL_ALL_Runtime_x.x.xxx.x.CAB
 - Model File (SM-XXXXX_OPEN_CALIBRATION_VER_x.x.xxx.xx.CAB)

※ It is required to use the latest program.

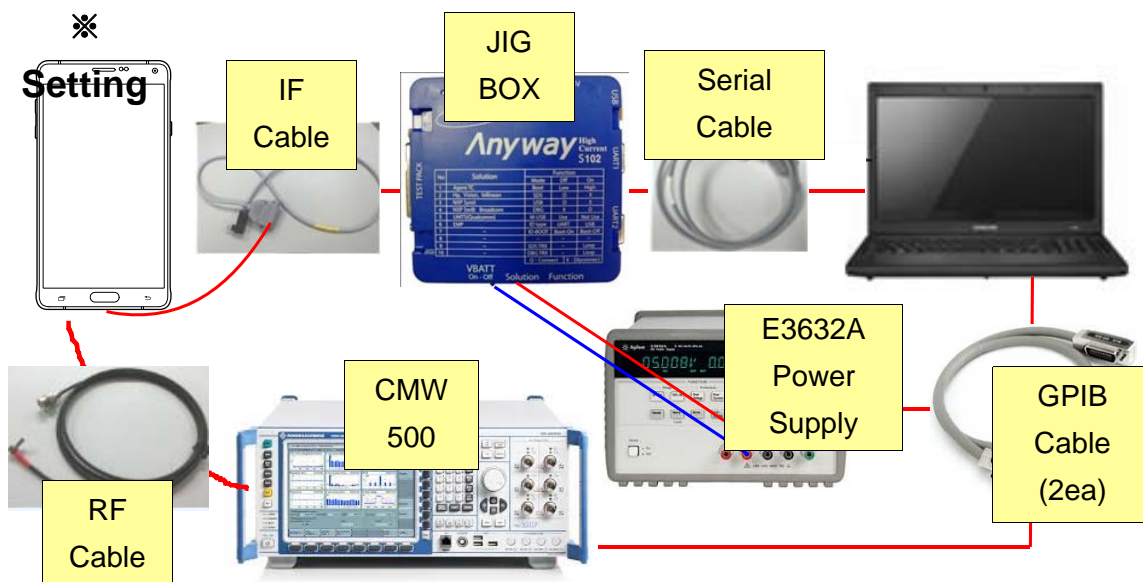
- Mobile Phone
- E3632A Power Supply
- JIG BOX (GH81-11888A)
- JIG BOX (5902-002550)
- Adapter (GH99-38251A)
- 4 Port Divider (GH81-11962A)
- 1.35Φ RF Cable (GH81-11459A, 2ea)
- R&S CMW500
- GPIB Cable (2ea)
- Adapter (GH81-11888K)
- Jig Cable (GH81-10965A)
- UART Serial Cable
- 50Ω Termination (GH81-11962E, 2ea)
- Divider RF Cable (GH81-11962B)

IF Cable	GH81-10965A	GH81-10952A	GH81-11171A	
	7 pin	7 pin (New)	7 pin (Old)	
RF Cable	GH81-11459A	GH81-11962G	GH81-11962C	GH81-11962F
	1.35T, Short	1.35T, Long	1.6T, Short	1.6T, Long
4 Port Divider	GH81-11962A			
	Use / No use			

※ Setting

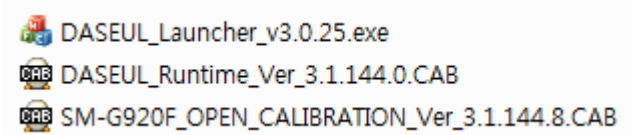


※ Setting

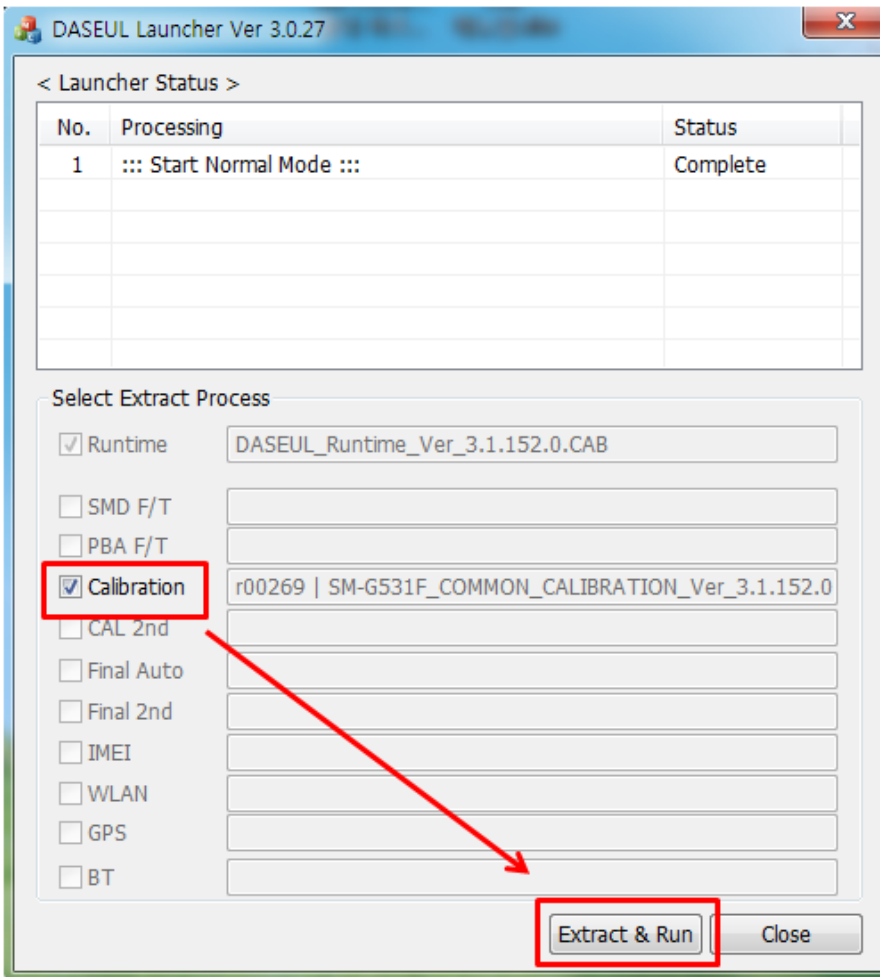


6-1-2. RF Calibration Program

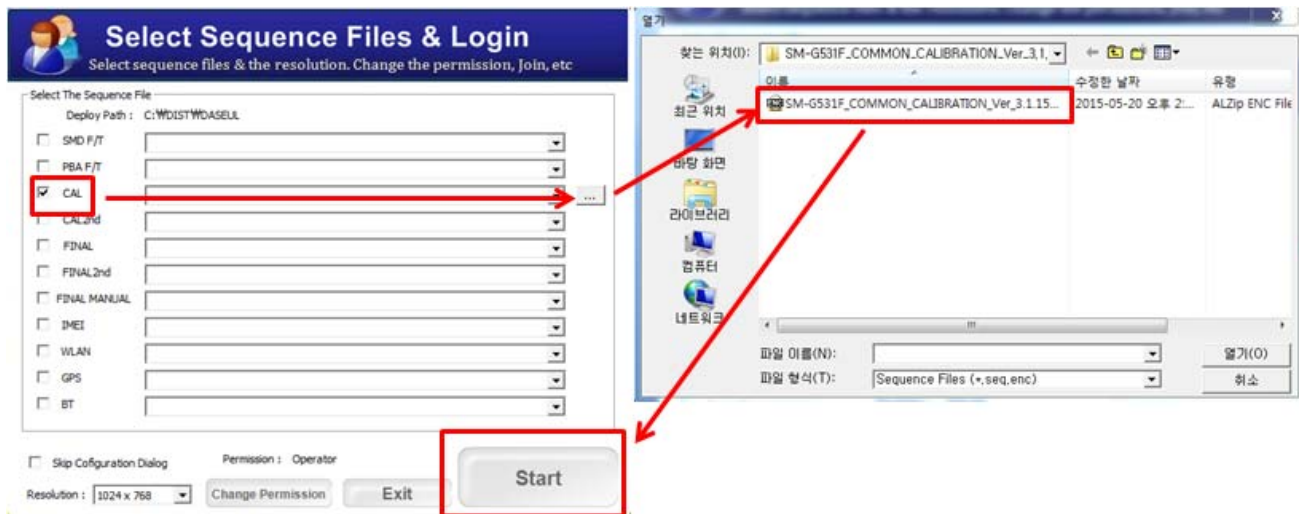
1. Run the RF Calibration Program Launcher, '[DASEUL_Launcher_vx.x.xx.exe](#)'.



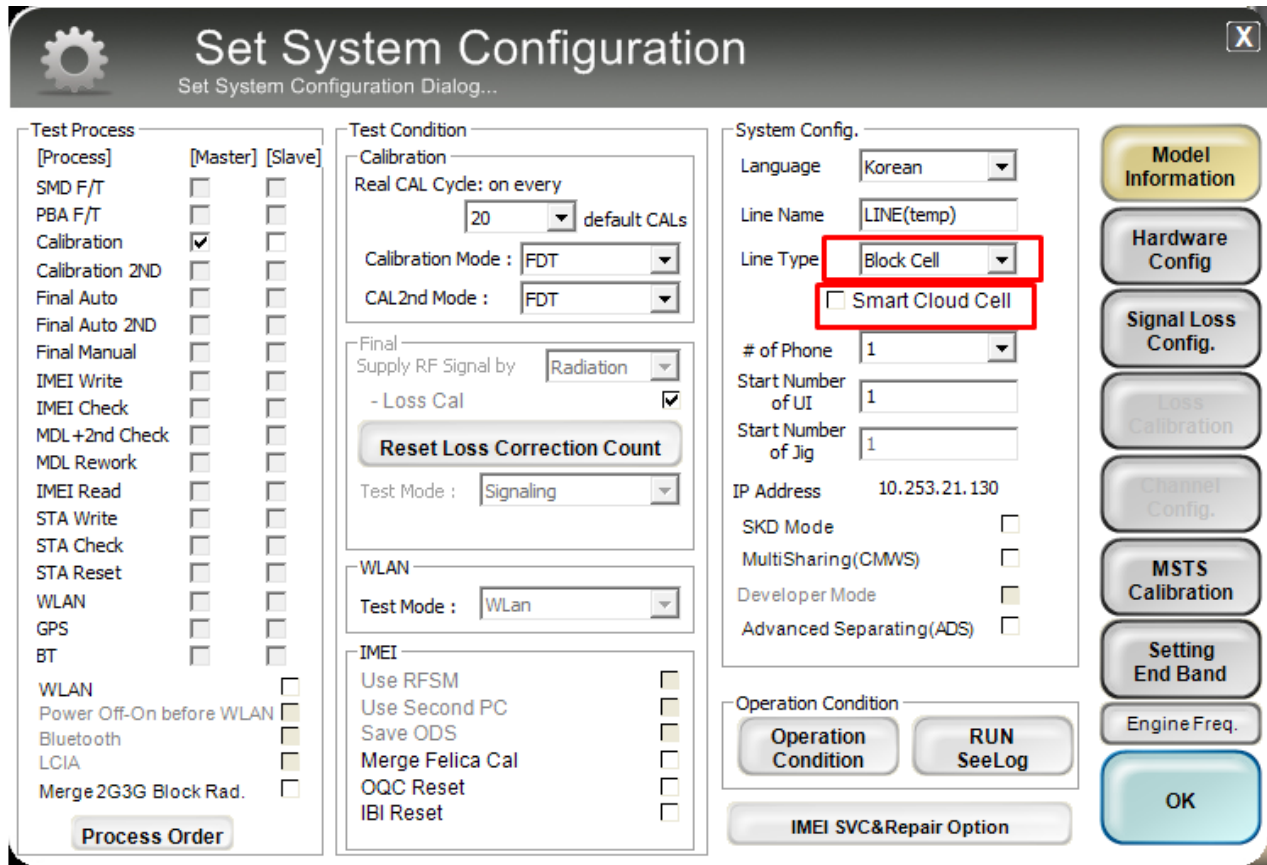
2. Check the '[Calibration](#)' menu, and select '[Extract & Run](#)'.



3. Check the 'CAL' and open the [model file](#), then select 'Start' button.



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

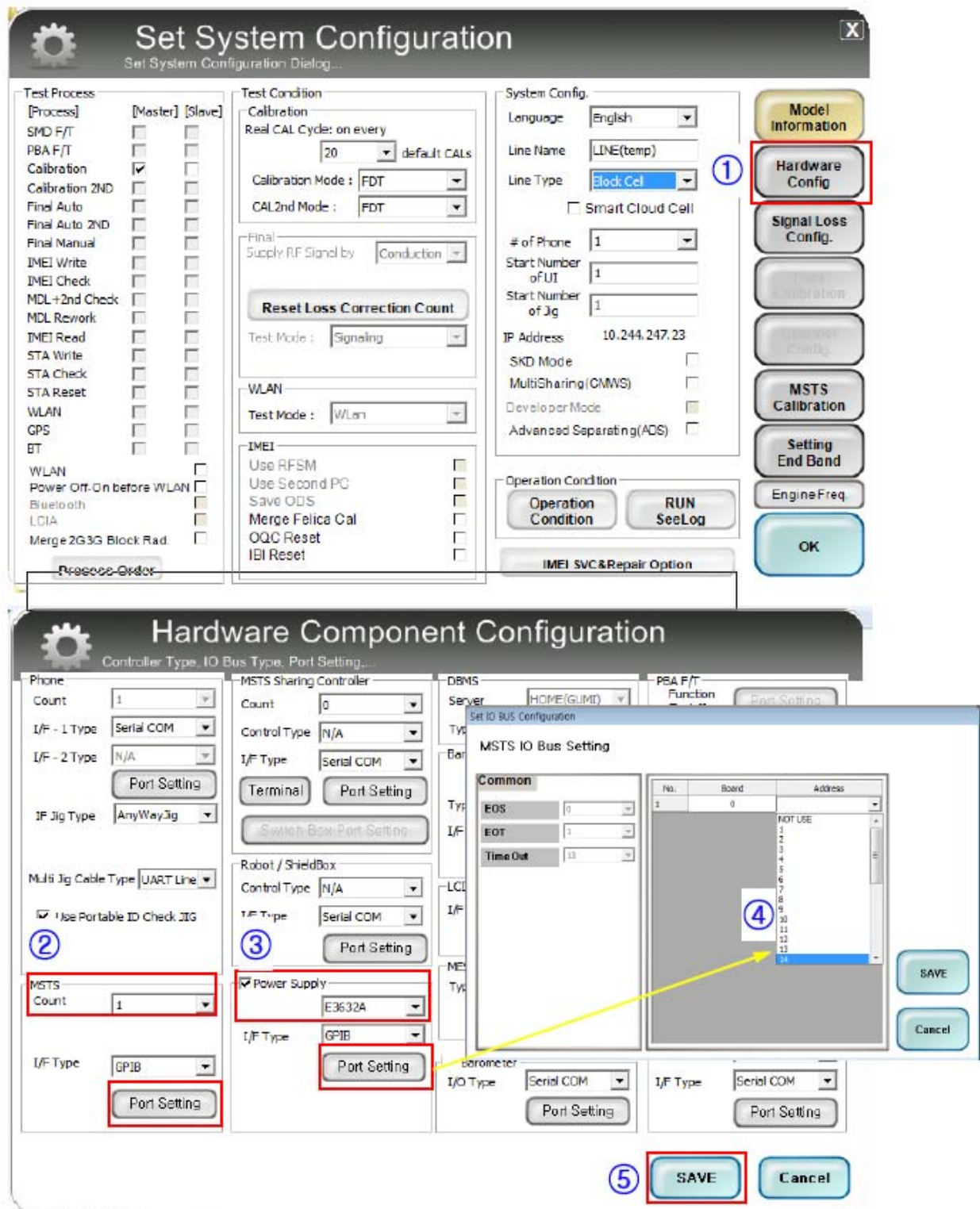


The image shows a 'Set System Configuration' dialog box with the following sections:

- Test Process:** A list of processes with checkboxes for [Process], [Master], and [Slave]. 'Calibration' is checked under [Process].
- Test Condition:**
 - Calibration:** Real CAL Cycle: on every 20 default CALs. Calibration Mode: FDT. CAL2nd Mode: FDT.
 - Final:** Supply RF Signal by: Radiation. - Loss Cal: checked. Reset Loss Correction Count button. Test Mode: Signaling.
 - WLAN:** Test Mode: WLAN.
 - IMEI:** Use RFSM, Use Second PC, Save ODS, Merge Felica Cal, OQC Reset, IBI Reset (all unchecked).
- System Config.:**
 - Language: Korean.
 - Line Name: LINE(temp).
 - Line Type: Block Cell (highlighted with a red box).
 - Smart Cloud Cell: unchecked (highlighted with a red box).
 - # of Phone: 1.
 - Start Number of UI: 1.
 - Start Number of Jig: 1.
 - IP Address: 10.253.21.130.
 - SKD Mode, MultiSharing(CMWS), Developer Mode, Advanced Separating(ADS): all unchecked.
- Operation Condition:** Operation Condition button, RUN SeeLog button, IMEI SVC&Repair Option button.

On the right side, there is a vertical stack of buttons: Model Information, Hardware Config, Signal Loss Config., Loss Calibration, Channel Config., MSTs Calibration, Setting End Band, Engine Freq., and OK.

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)



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

