

2. Specification

2-1. GSM General Specification

	GSM850	EGSM 900	DCS1800	PCS1900	WCDMA 2100	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	880~915 925~960
ARFCN range	128~251	0~124 & 975~1023	512~885	512~810	UL: 9612~9888 DL: 10562~10838	UL: 2712~2863 DL: 2937~3088
Tx/Rx spacing	45MHz	45MHz	95MHz	80MHz	190MHz	45MHz
Mod. Bit rate/ Bit Period	270.833kbps 3.692us	270.833kbps 3.692us	270.833kbps 3.692us	270.833kbps 3.692us	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
Modulation	0.3GMSK	0.3GMSK	0.3GMSK	0.3GMSK	QPSKHQPSK	QPSKHQPSK
MS Power	33dBm~5dBm	33dBm~5dBm	30dBm~0dBm	30dBm~0dBm	24dBm~ -50dBm	24dBm~ -50dBm
Power Class	5pcl ~ 19pcl	5pcl ~ 19pcl	0pcl ~ 15pcl	0pcl ~ 15pcl	3(max+24dBm)	3(max+24dBm)
Sensitivity	-102dBm	-102dBm	-100dBm	-100dBm	-106.7dBm	-106.7dBm
TDMA Mux	8	8	8	8	8	8
Cell Radius	35Km	35Km	2Km	2Km	2Km	2Km

2. Specification

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 V6.0 (Marshmallow)
RF	GSM (GSM850/ EGSM900/ DCS1800/ PCS1900), WCDMA Band1/ WCDMA Band8)
Battery	1,500mAh
Base Band	1.2GHz Quad
Other RF	A-GPS, Glonass, BT4.0, USB 2.0, WIFI 802.11 b/g/n SISO
Camera	5MP Main CAM , VGA CAM(Front)
LCD	4.0" WVGA LCD TFT, 480 x 800
RAM	8Gb RAM + 8GB eMMC
Sensor	Accelerometer
Accessory	Charger: 5V/0.7A 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. 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.

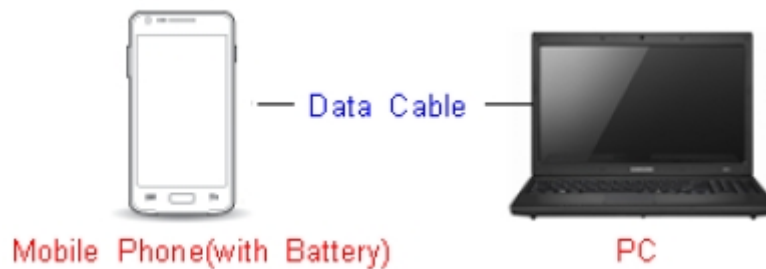
6. Level 1 Repair

6-1. S/W installation

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

- Installation program: Downloader Program ([Odin3 v3.09.exe](#))
- Mobile Phone
- Data Cable
- Mobile device specific S/W: Binary files

✳ Settings

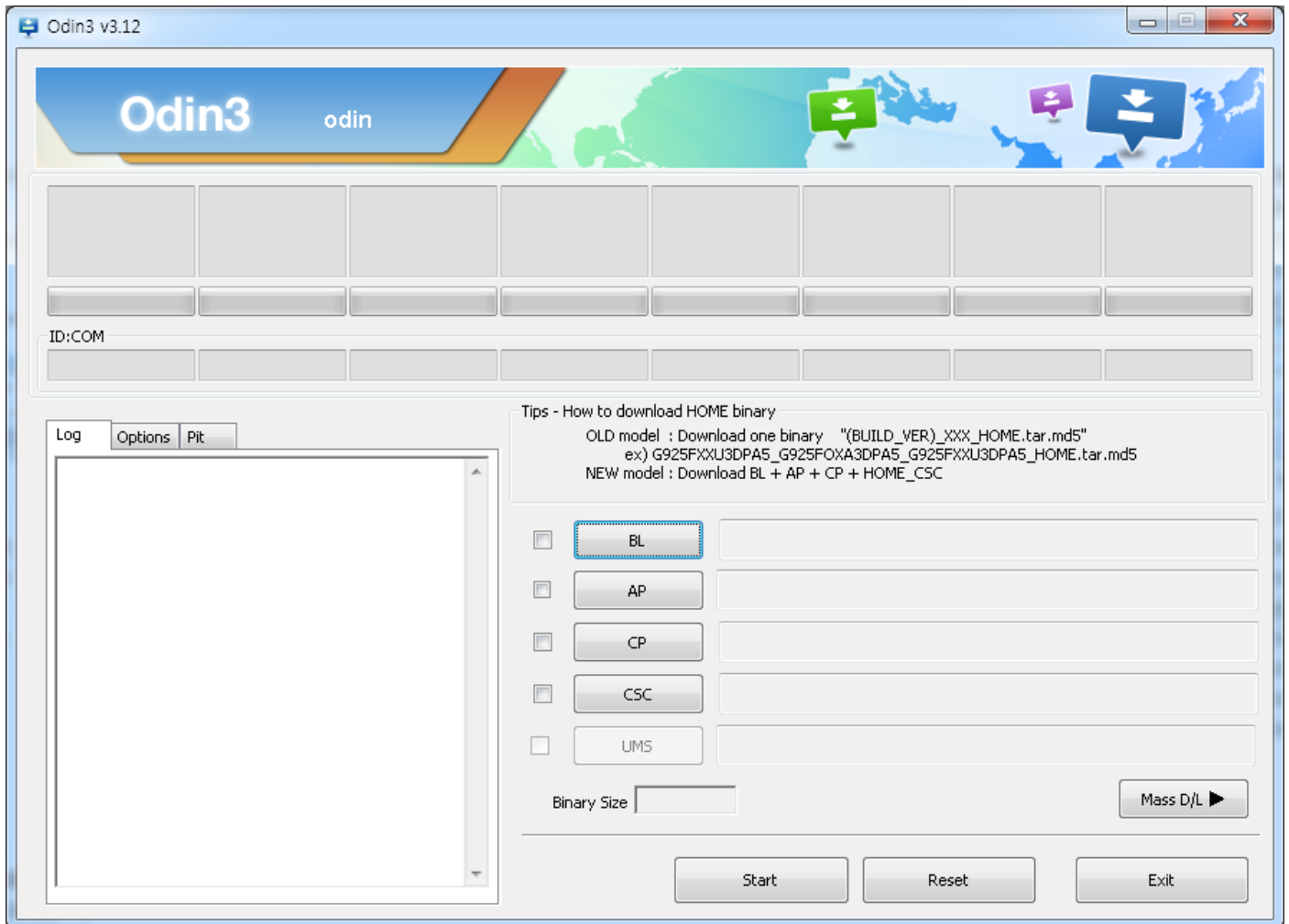


Data Cable : GH39-01711C, GH39-01710D

6. Level 1 Repair

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

- Open up the S/W Installation Program by executing the "**Odin3 v3.12.7.exe**"

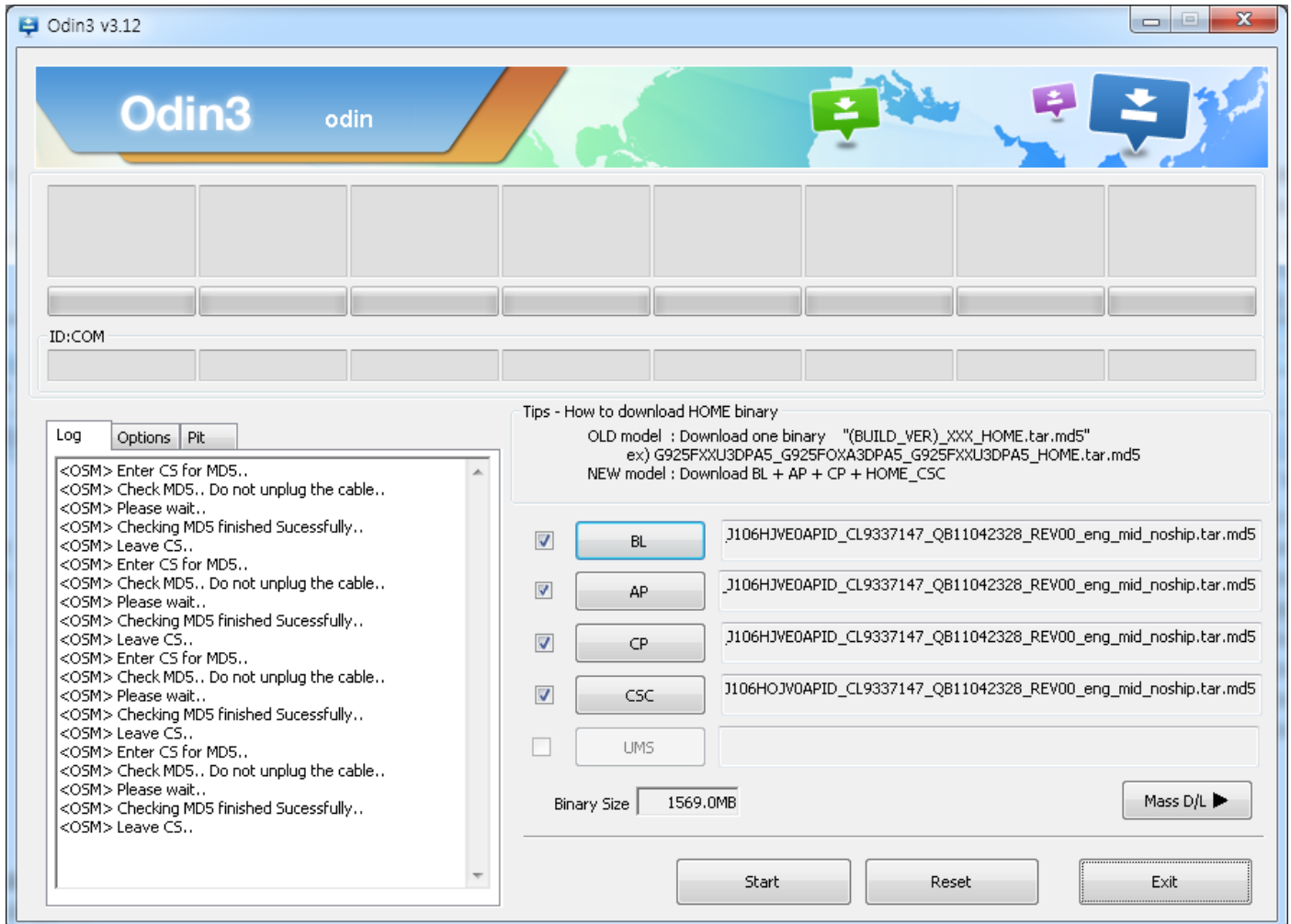


6. Level 1 Repair

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

- Check Auto Reboot, Re-Partition, and F. Reset Time
- Check PIT
- Check BOOTLOADER, PDA, PHONE, and CSC Files

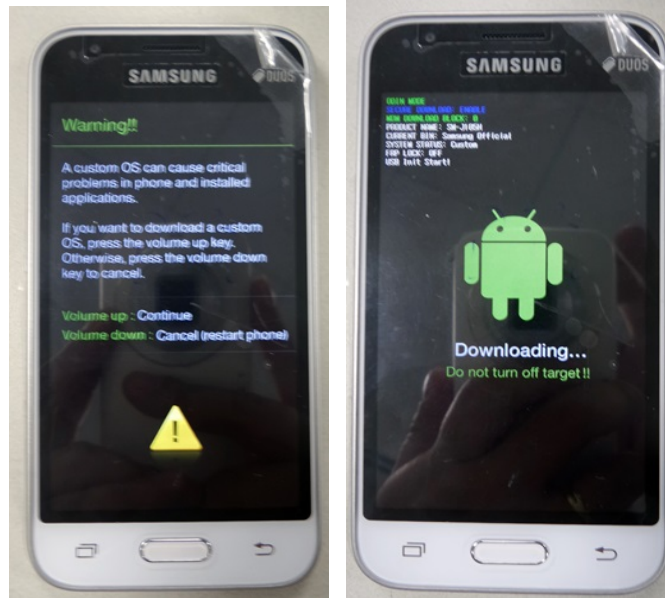
* Note : "Odin v3.09 or above" checks MD5 checksum just after file selection.



6. Level 1 Repair

2. Enter into Download Mode

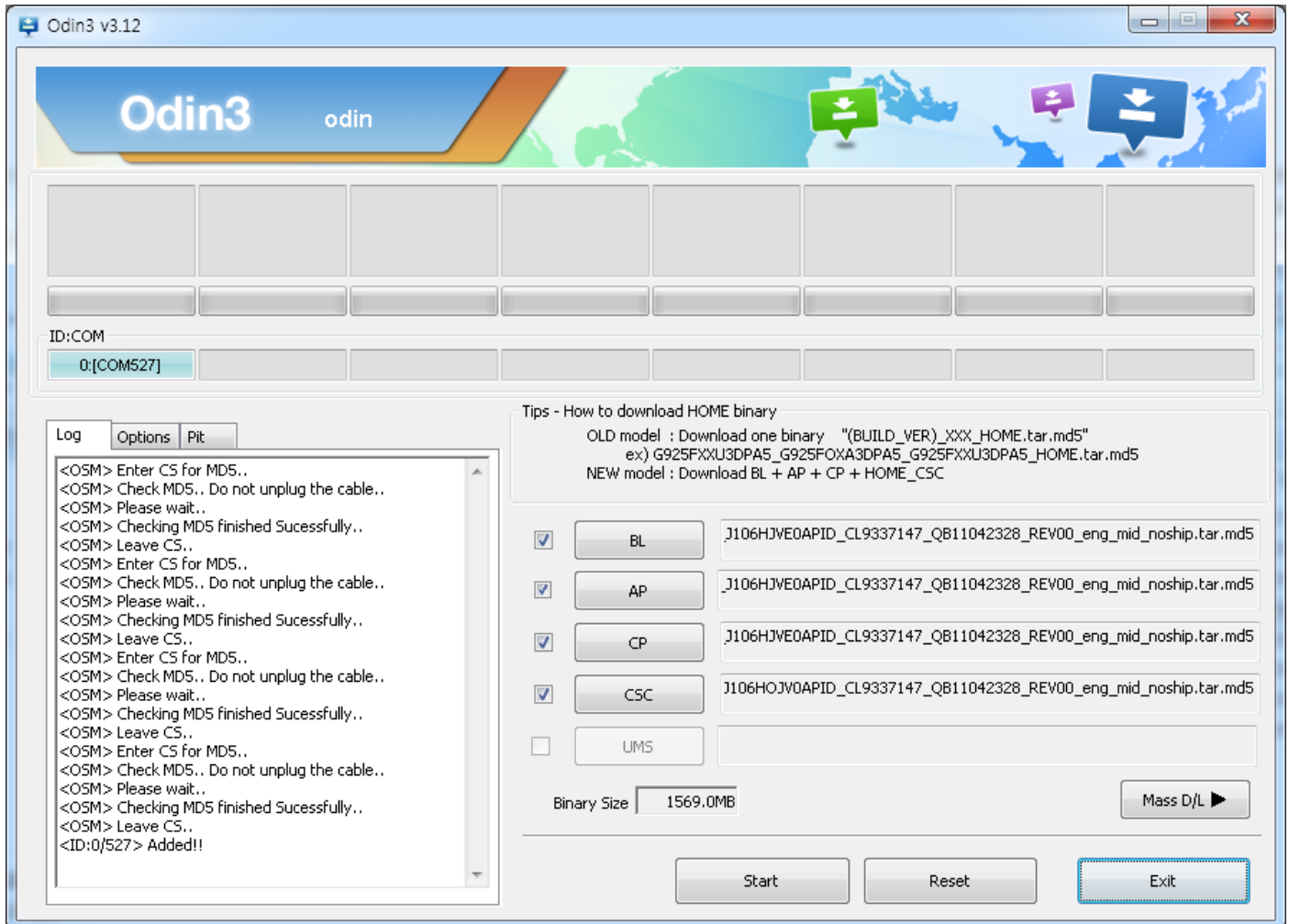
- Enter into Download Mode by pressing Volume Down button, Home button and ON/OFF Button simultaneously followed by pressing Volume up button as a direction of the phone.



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.



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 Reset by Settings → Accounts → Backup and reset

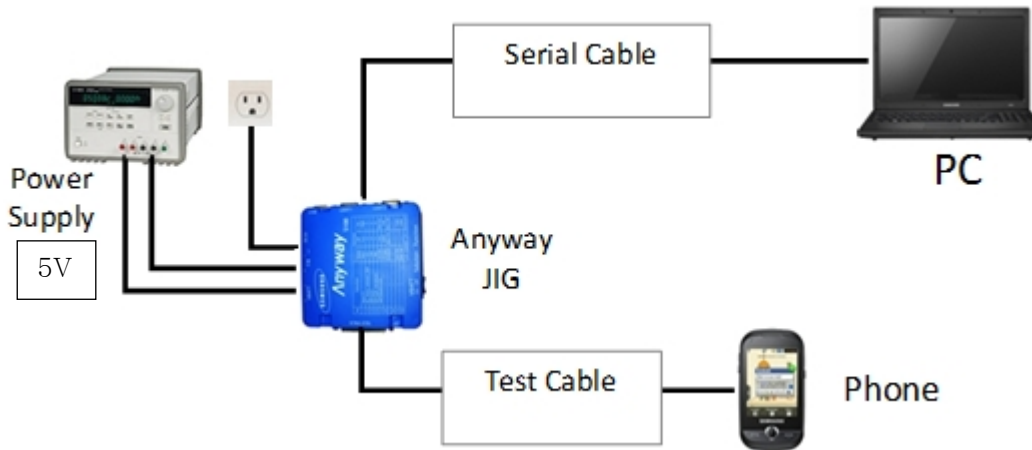
6. Level 1 Repair

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_25 or higher -Uploaded on HHPsvc Notice
③ Runtime File	1. DASEUL_Runtime_Ver_3.1.139.0.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

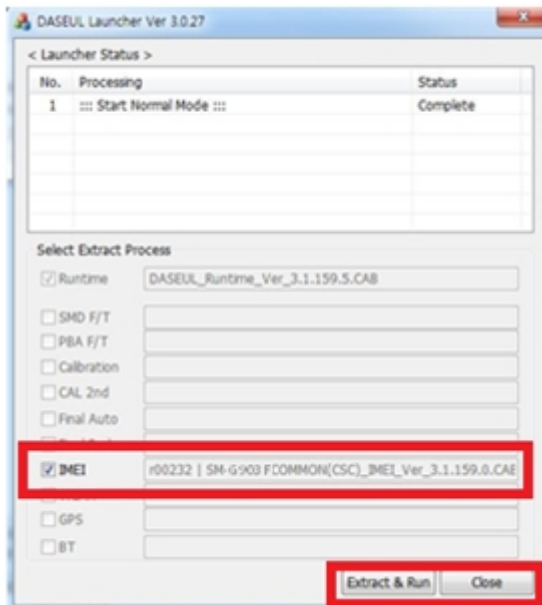
6. Level 1 Repair

6-2-2 IMEI writing Process

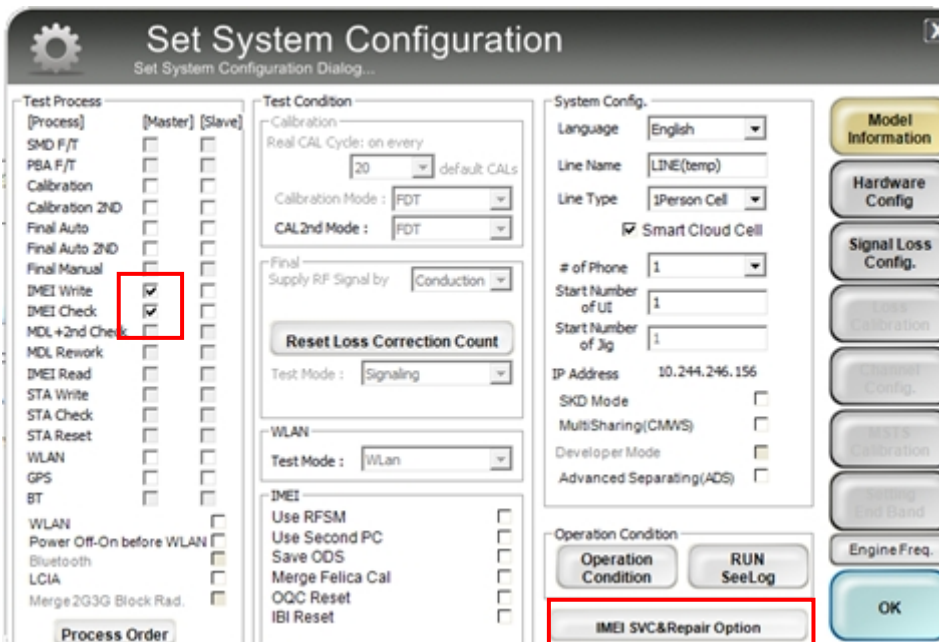
1. Run DASEUL_SVC_Launcher_v3.0.10.exe

 DASEUL_Launcher_v3.0.27.exe

2. Select IMEI and then Extract & Run

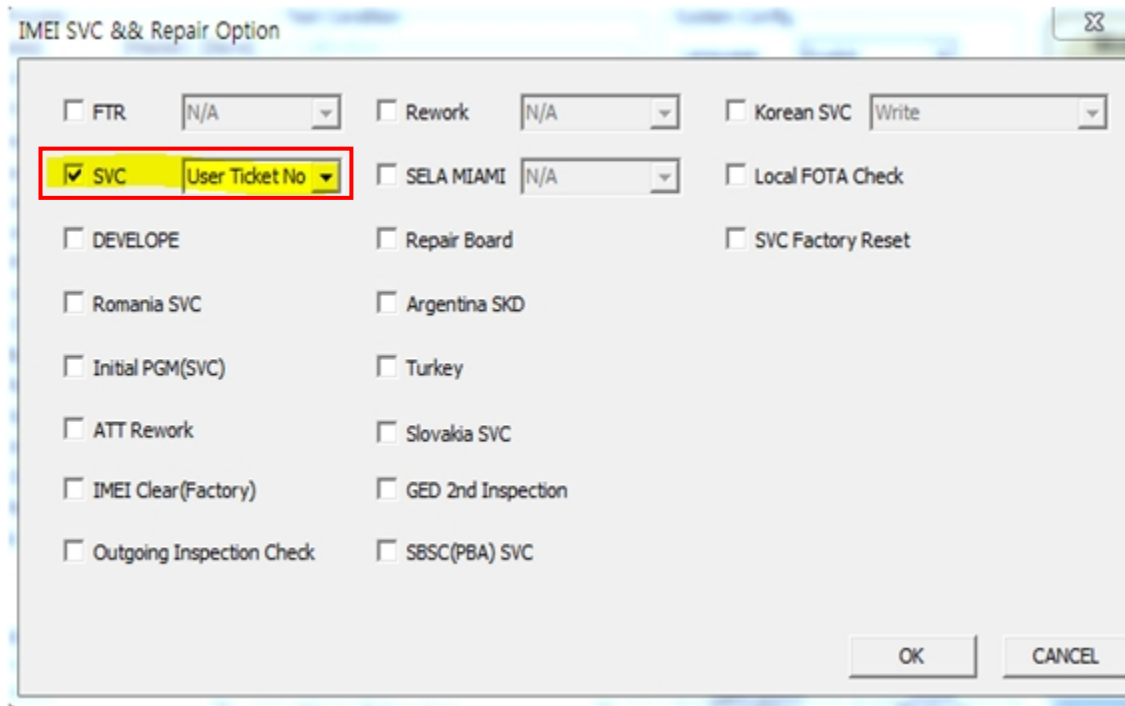


3. Check 'IMEI Write / IMEI Check', and click 'IMEI SVC & Repair Option'

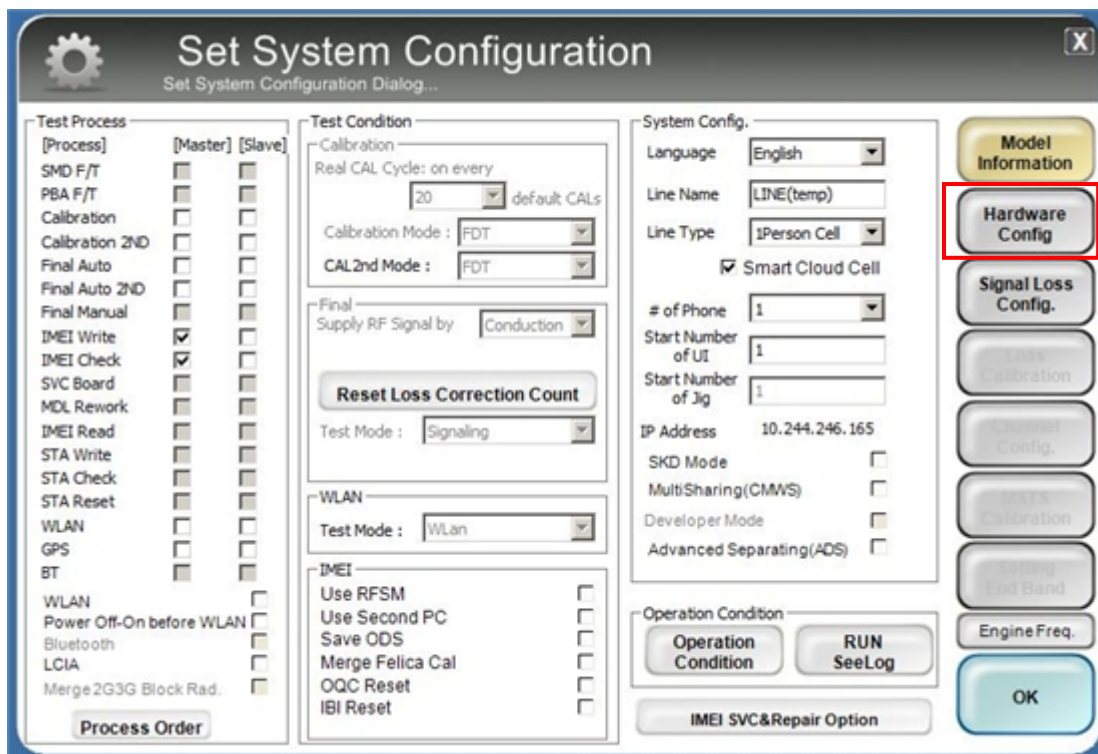


6. Level 1 Repair

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



5. Click 'Hardware Config'



6. Level 1 Repair

6. Click 'Port Setting'

Hardware Component Configuration
Controller Type, IO Bus Type, Port Setting,....

Phone
Count: 1
I/F - 1 Type: Serial COM
I/F - 2 Type: N/A
Port Setting
IF Jig Type: AnyWayJig
 Use ID Check JIG

MSTS Sharing Controller
Count: 0
Control Type: N/A
I/F Type: Serial COM
Terminal: Port Setting

DEMS
Server: HOME(GUMI)
Type: Outside-Socket

Barcode Reader
Type: N/A
I/F Type: Serial COM
Port Setting

MES PN Sender
Type: N/A
Port Setting

PBA F/T
Function Test Jig: Port Setting
NI-DAQ: Port Setting
Power Detector: Port Setting
HDMI JIG: Port Setting

MSTS
Count: 0
I/F Type: GPIB
Port Setting

Robot / ShieldBox
Control Type: N/A
I/F Type: Serial COM
Port Setting

Power Supply
I/F Type: GPIB
Port Setting

SMD F/T
Type: N/A
B'd Address: 5
Port Setting

SAVE
Cancel

7. Select Port Number and SAVE

Set IO BUS Configuration

Phone IO Bus Setting

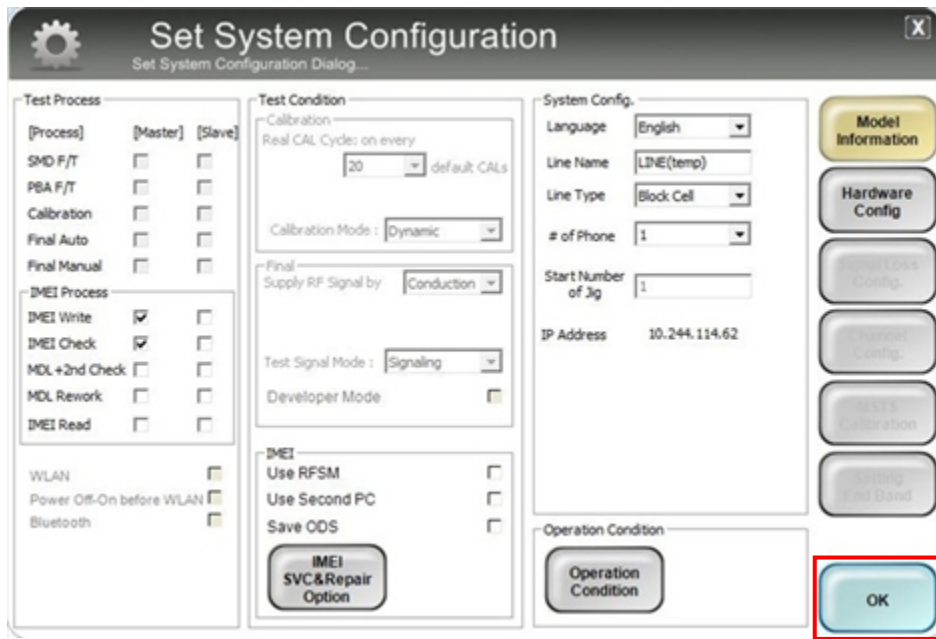
Common
BaudRate: 115200
Data Bit: 8
Parity: No
Stop Bit: 1

No.	Port #1
1	1

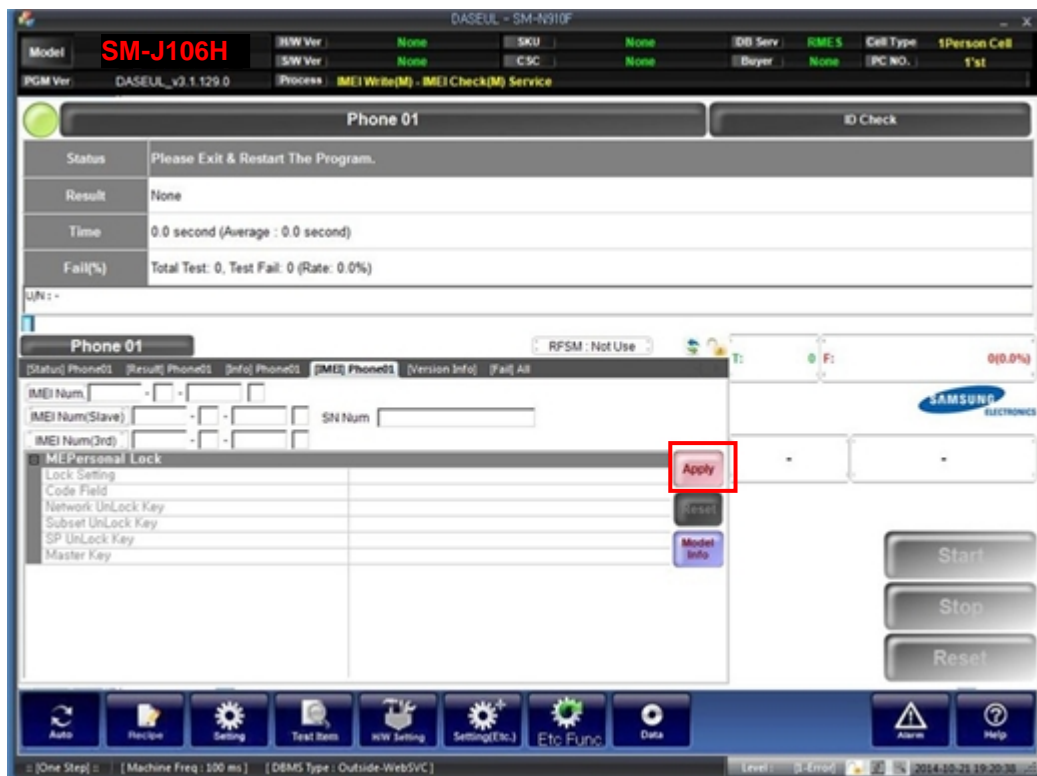
SAVE
Cancel

6. Level 1 Repair

8. Click OK to proceed



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



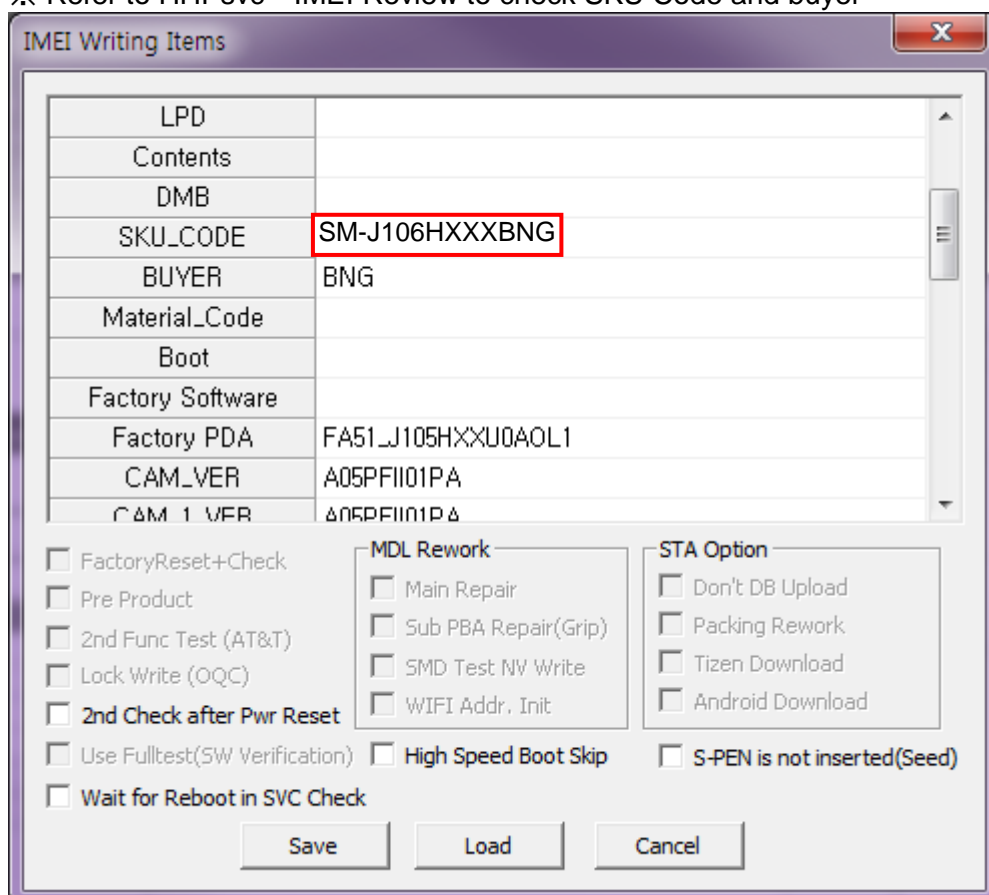
6. Level 1 Repair

10. Click OK



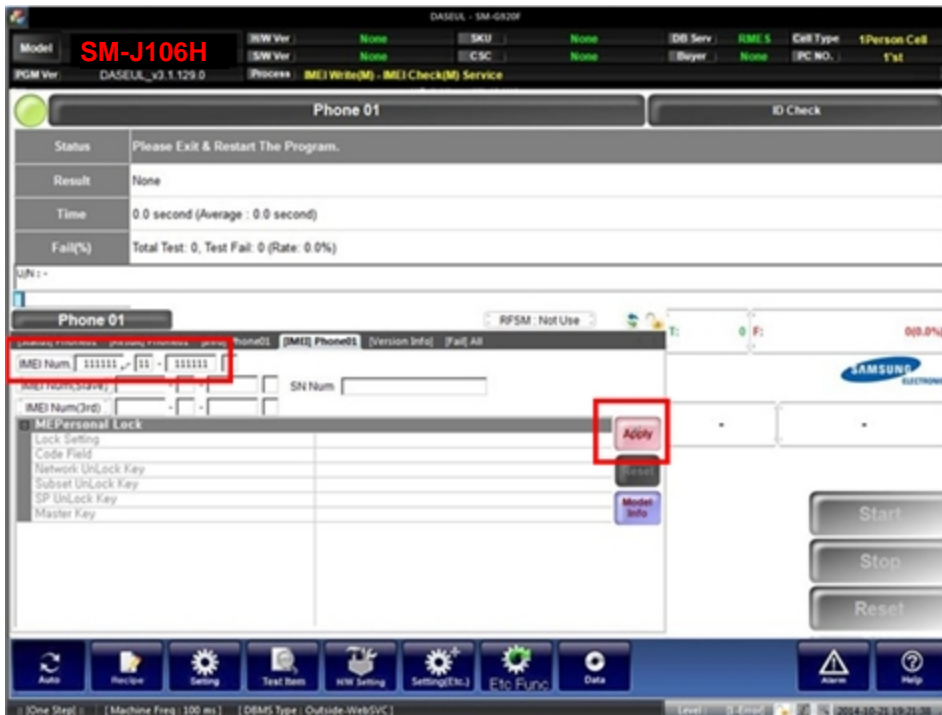
11. Input SKU_CODE and BUYER, then click Save button.

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

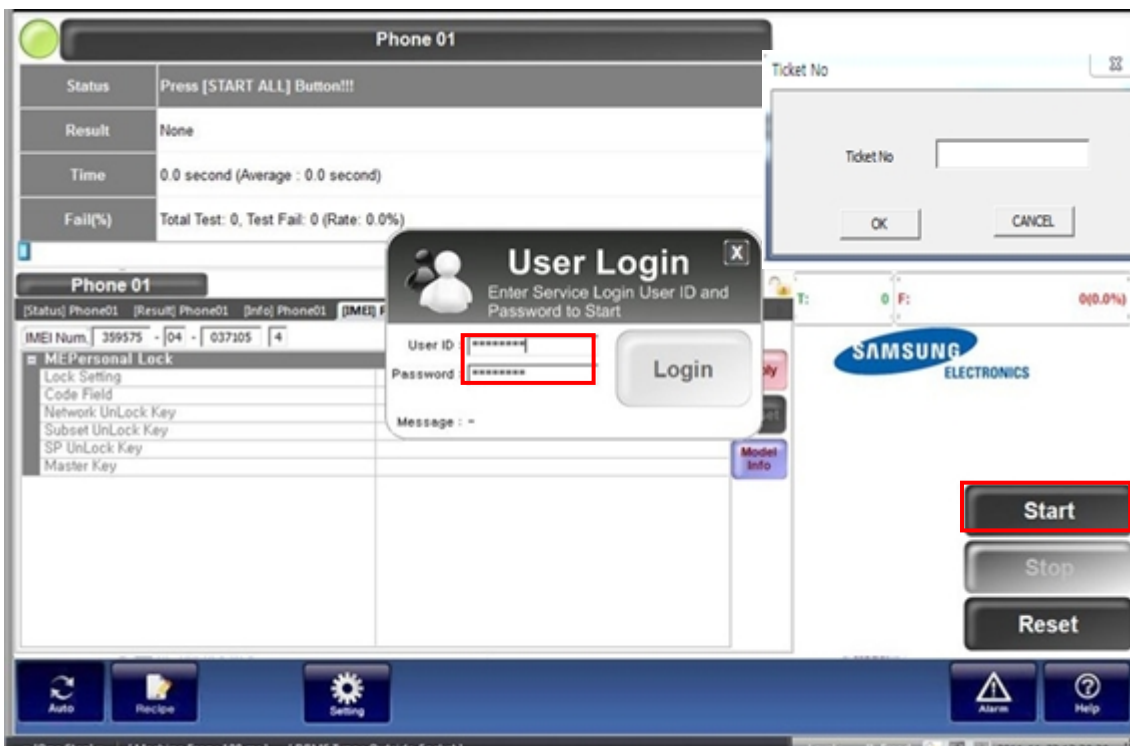


6. Level 1 Repair

12. Input IMEI Number and click Apply



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



6. Level 1 Repair

6-3. RF Calibration

6-3-1. 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.

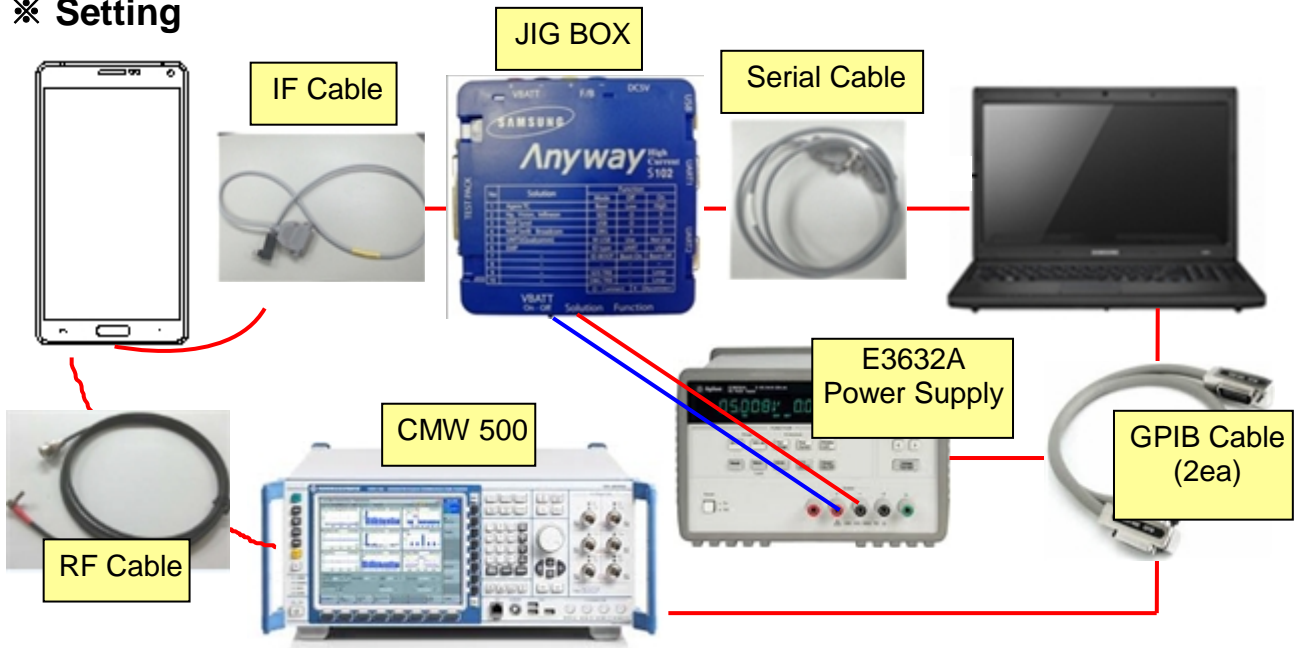
- Mobile Phone
- E3632A Power Supply
- JIG BOX (GH81-11888A)
- UART Serial Cable
- R&S CMW500
- GPIB Cable (2ea)
- Adapter (GH44-02712A)

- Table of test cables

IF Cable	GH81-10631A 11 pin	GH81-10952A 7 pin (New)	GH81-11171A 7 pin (Old)	GH81-11962T 7 pin (New)
RF Cable	GH81-11962M 1.2T (New) 	GH81-11962G 1.35T, 1750mm 	GH81-11962C 1.6T, 400mm 	GH81-11962F 1.6T, 1700mm 
	GH81-08798A 			
4 Port Divider	GH81-11962A Divider 	GH81-11962B Divider Cable 	GH81-11962E 50Ω Terminator 	

6. Level 1 Repair

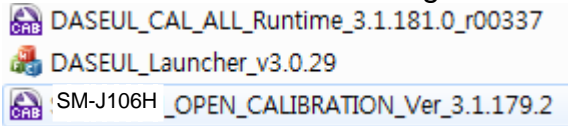
※ Setting



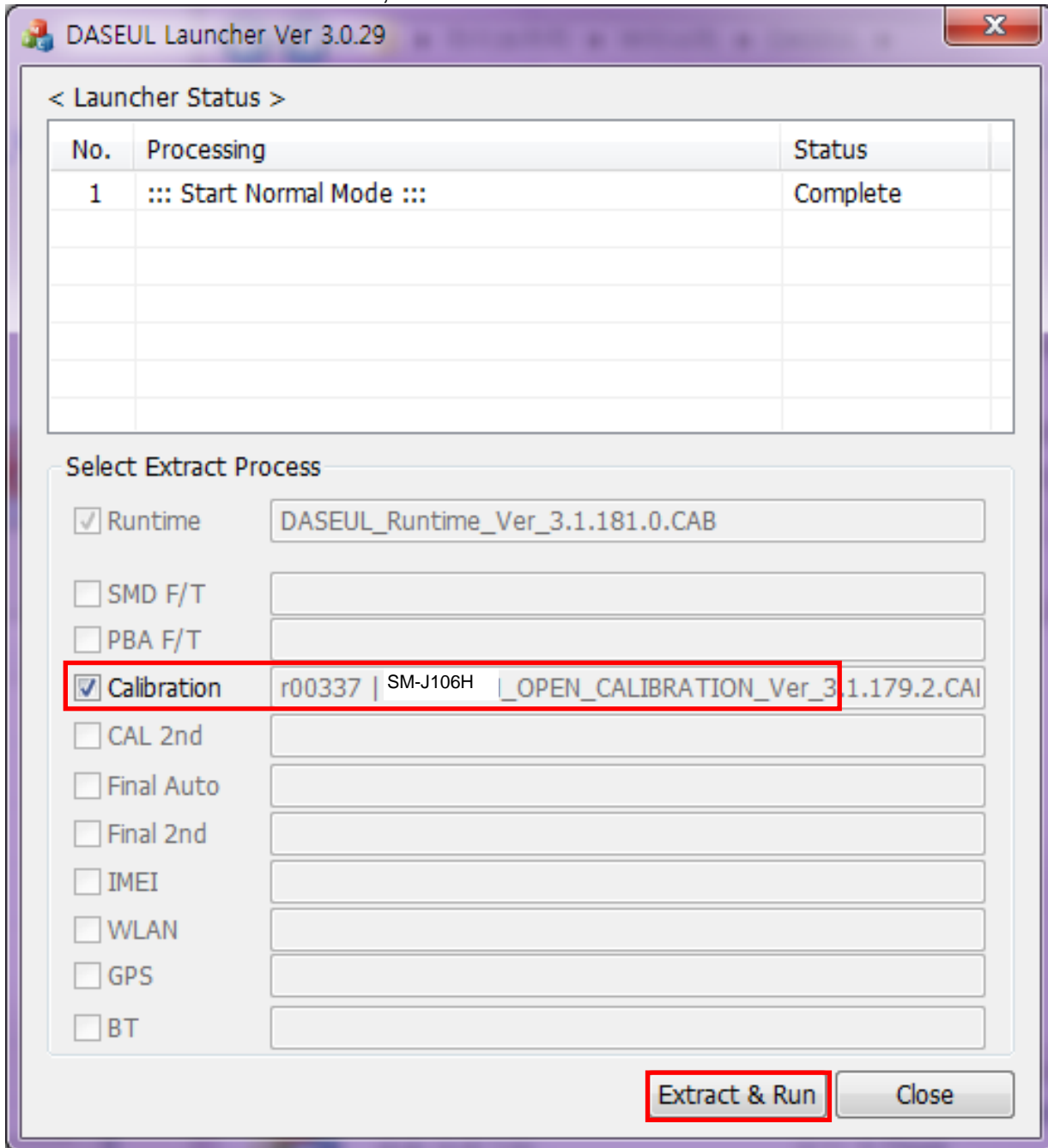
6. Level 1 Repair

6-3-2. RF Calibration Program

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

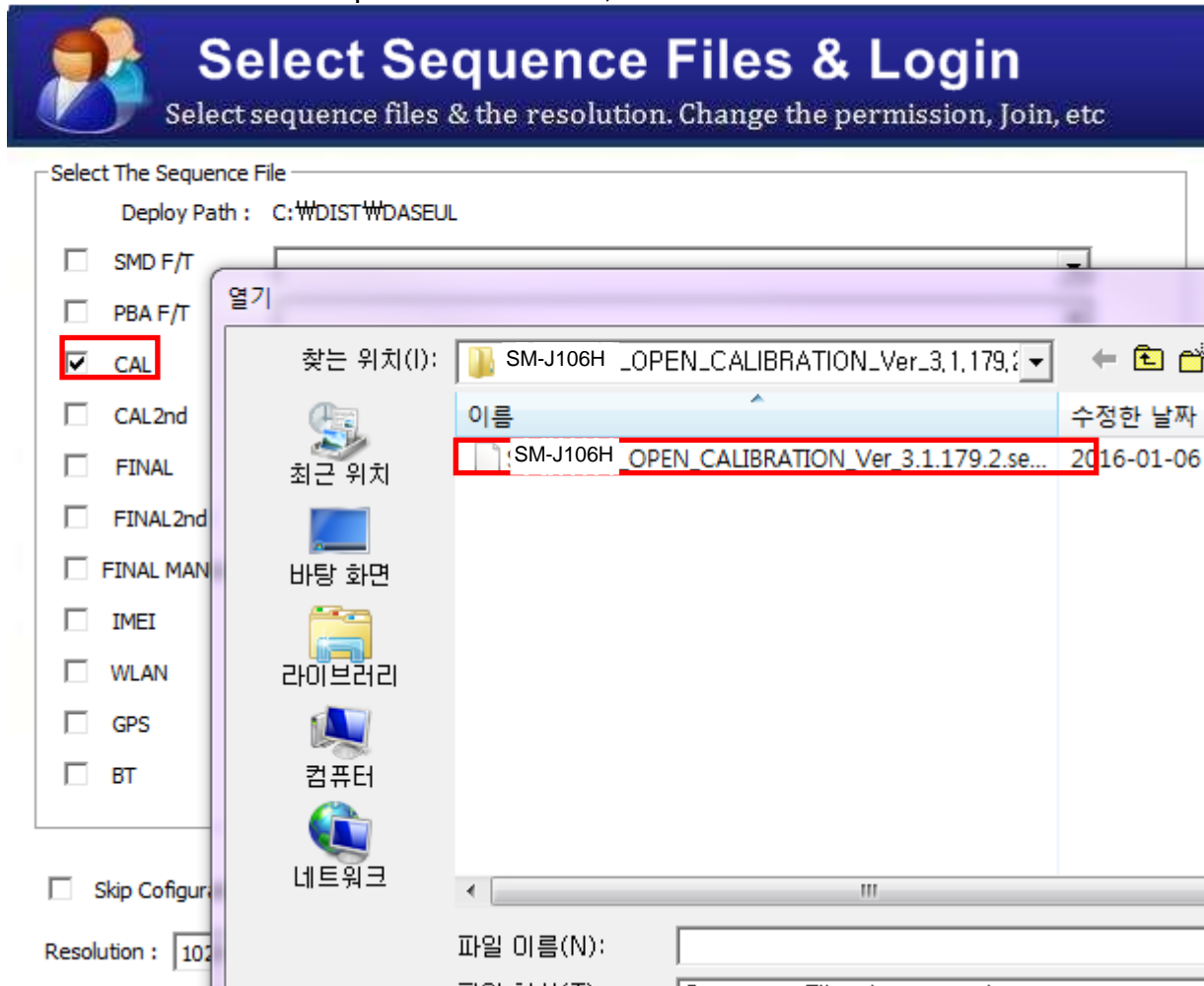


2. Check the 'Calibration' menu, and select 'Extract & Run'.



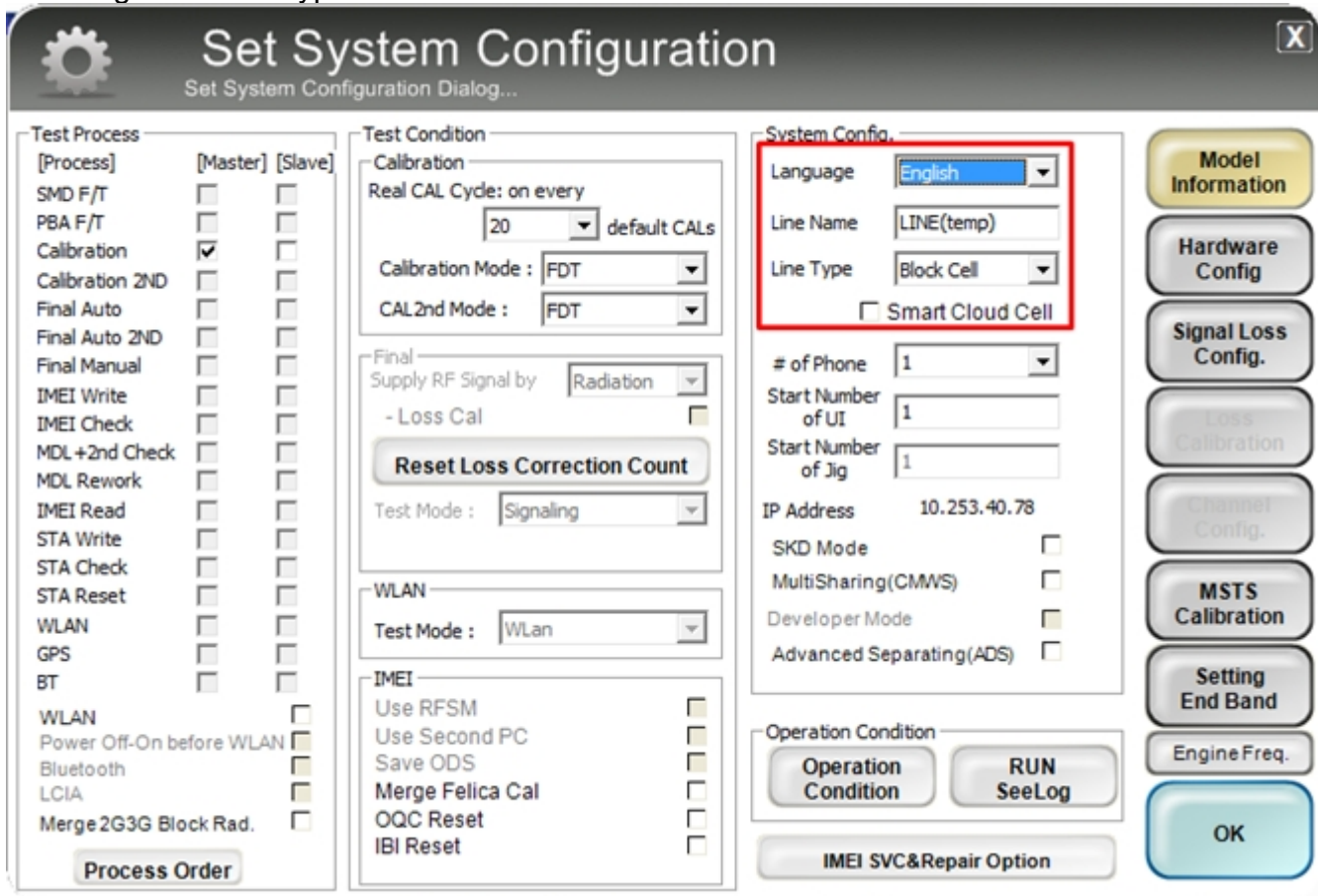
6. Level 1 Repair

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



6. Level 1 Repair

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



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 checked="" 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 type="checkbox"/>	<input type="checkbox"/>
IMEI Check	<input 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

- Loss Cal

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

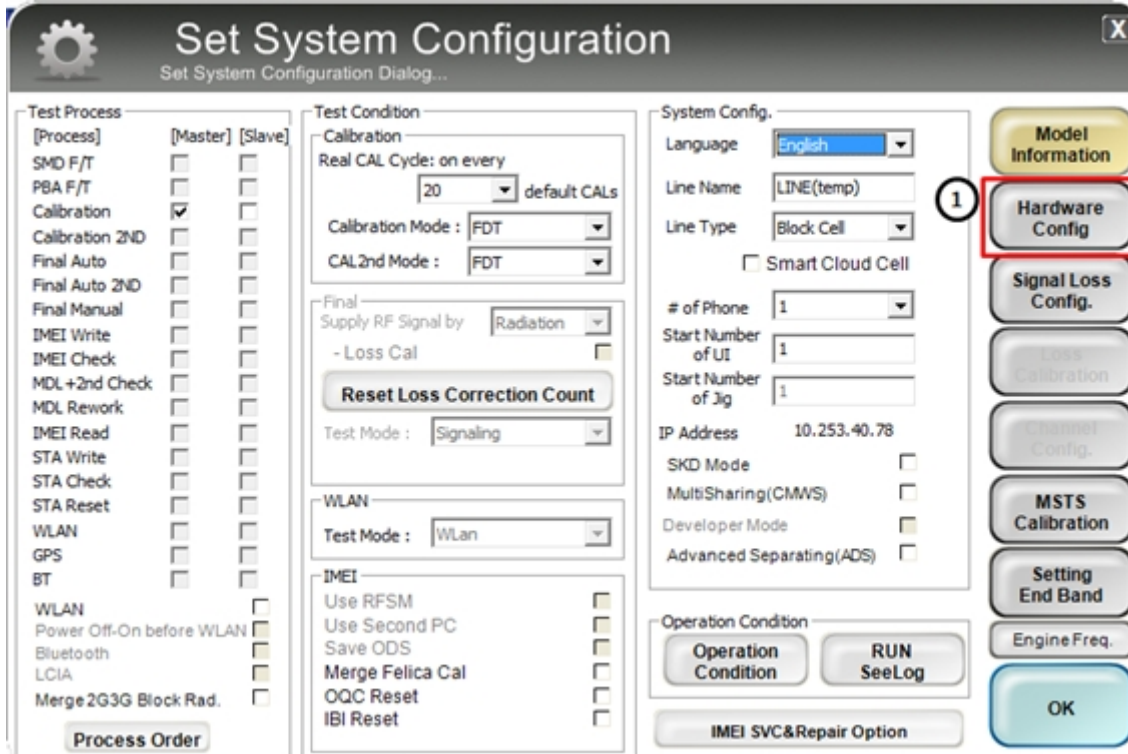
Advanced Separating(ADS)

Operation Condition

Model Information

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)



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 checked="" 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 type="checkbox"/>	<input type="checkbox"/>
IMEI Check	<input 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
20 default CALs

Calibration Mode: FDT
CAL2nd Mode: FDT

Final
Supply RF Signal by: Radiation
- Loss Cal
Reset Loss Correction Count
Test Mode: Signaling

WLAN
Test Mode: WLAN

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

System Config.

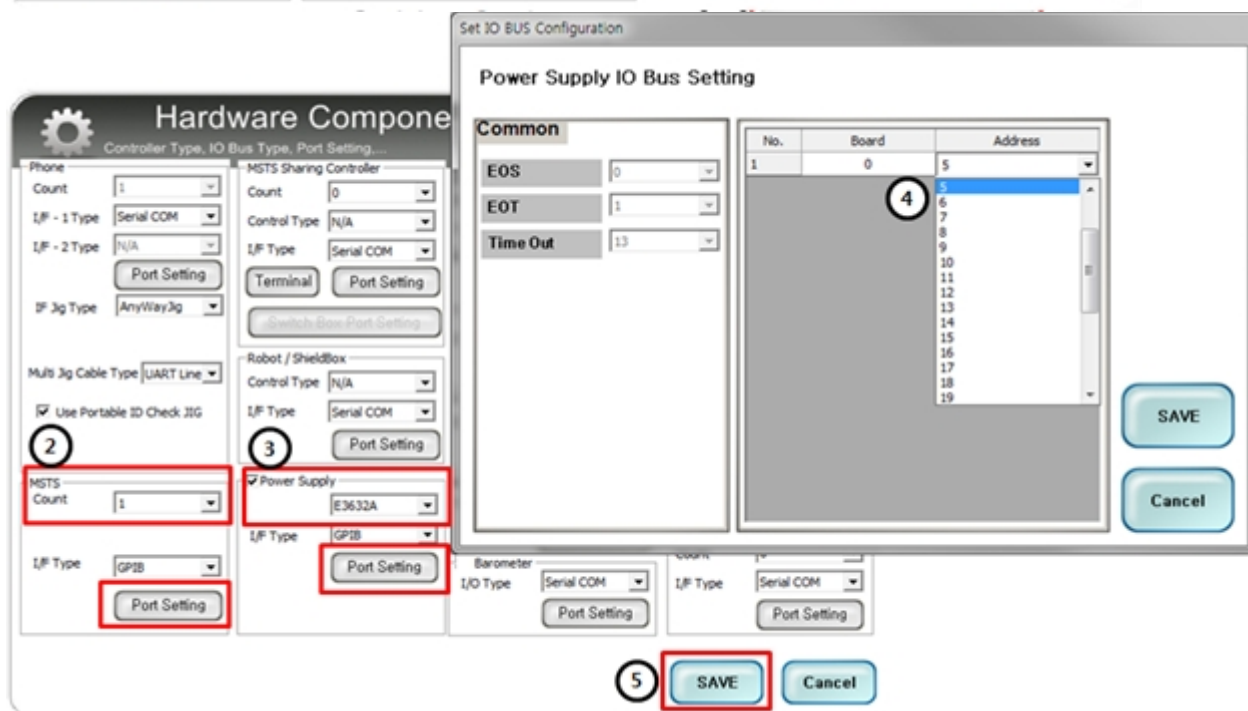
Language: English
Line Name: LINE(temp)
Line Type: Block Cell
 Smart Cloud Cell

of Phone: 1
Start Number of UT: 1
Start Number of Jig: 1
IP Address: 10.253.40.78

SKD Mode
MultiSharing(CMWS)
Developer Mode
Advanced Separating(ADS)

Operation Condition
RUN
SeeLog
IMEI SVC&Repair Option

Model Information
Hardware Config
Signal Loss Config.
Loss Calibration
Channel Config.
MSTS Calibration
Setting End Band
Engine Freq.
OK



Hardware Component
Controller Type, IO Bus Type, Port Setting...

Phone
Count: 1
I/F - 1 Type: Serial COM
I/F - 2 Type: N/A
I/F Jig Type: AnyWayJig
Multi Jig Cable Type: UART Line
 Use Portable ID Check JIG

MSTS Sharing Controller
Count: 0
Control Type: N/A
I/F Type: Serial COM
Terminal
Port Setting
Switch Base Port Setting

Robot / ShieldBox
Control Type: N/A
I/F Type: Serial COM
Port Setting

Power Supply
E3632A
I/F Type: GPIB
Port Setting

Barometer
I/O Type: Serial COM
Port Setting

Cooling
I/F Type: Serial COM
Port Setting

Set IO BUS Configuration
Power Supply IO Bus Setting

Common
EOS: 0
EOT: 1
Time Out: 13

No.	Board	Address
1	0	5
2		6
3		7
4		8
5		9
6		10
7		11
8		12
9		13
10		14
11		15
12		16
13		17
14		18
15		19

SAVE
Cancel

SAVE
Cancel

6. Level 1 Repair

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

