

# SAMSUNG

## Mobile Device

# ***SERVICE*** *Manual*

## Contents

# Common

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# Revision History

Rev	Date	Page	Description	Remark
1.0	11-June-2021	All	- Initial document creation	-

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## ※ References

- Standard Service Guides
- [SVC-01] General Repair Information
- [SVC-02] Technical Repair Guide
- [SVC-05] Major Parts Handling Guide (battery handling guide)
- [SVC-07] Fenrir User Manual
- [SVC-11] Water Resistance Test Guide

# 1. Safety Precautions

## 1-1. Repair Precaution

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

Do not touch metallic parts or circuits with your bare hands as device(parts, circuits, etc) may be corroded.

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 Protection

### ESD (Electrostatic Discharge)

: It is the sudden flow of electricity between two electrically charged objects caused by contact, an electrical short, or dielectric breakdown. ESD can cause negative effects on mobile phone, especially electrical parts.

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.

OK	NG		
			
tightly	Do not put on loosely	Do no wear on accessory	Do not ware on gloves or clothes

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.

### EPA (ESD Protected Area)

: It is the area where should be protected from ESD, i.e. PBA treatment area, parts storage area, assembly and disassembly area. It should be designated with EPA indicator.

	Sticker for Wall		Tape for floor
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### EOS (Electrical Overstress)

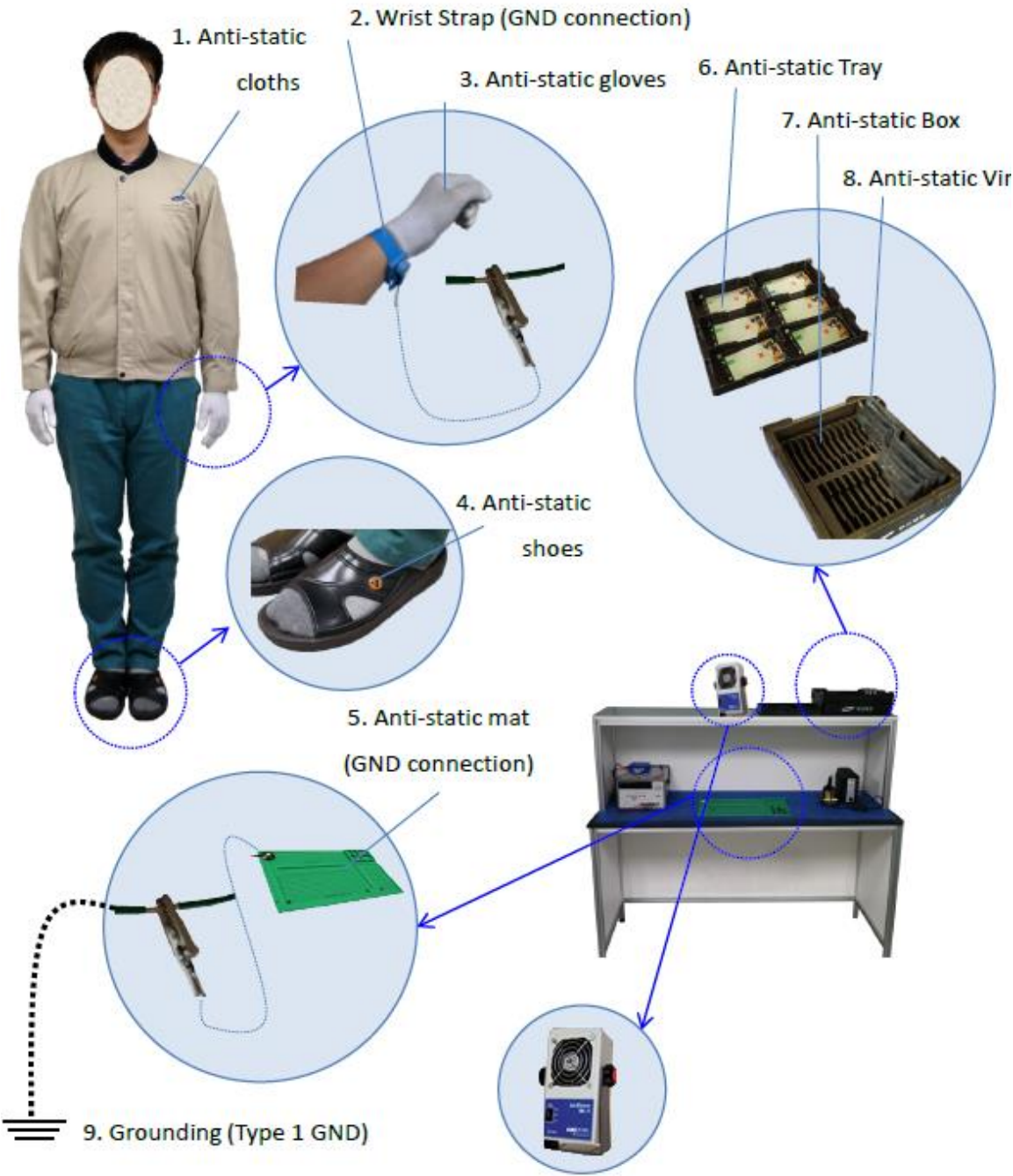
: It is a kind of spark caused by abnormal over voltage or current, and it makes damages to components or system.

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.

# 1. Safety Precautions

## 1-2. ESD Protection




### Essential Items for ESD protection



# 1. Safety Precautions

## 1-3. Battery Handling




Prerequisite (safety kit) for handling battery

Sand + Container	Heatproof gloves	Fire extinguisher
		
Sand , Container with cover • Container : Iron, Stainless, Aluminium ※You can prepare similar one with cover in your local market	Temperature protection : • Direct heat : 300℃ ↑ • Indirect heat : 700℃ ↑ ※You can buy similar gloves in your local market	Purpose : General fire extinguisher ※You can buy similar one in your local market

- Container cover is for blocking smoke from the battery during combustion.
- Above safety kit(Sand, glove, etc) should be placed in designated area.





### How to keep the battery

Case1 (BAD)	Case2 (BAD)	Case3 (GOOD)
		
Do not keep without unit box Do not keep bundle of one	Do not be piled up one and another	Put & tidy box in good shape





Cautions for battery handling

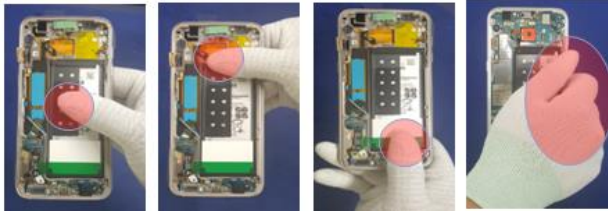
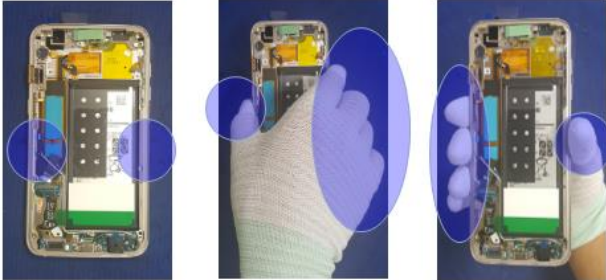
1) Do not use metal tweezers near the battery.

Risk factor	Solution
- Damage by using metal tweezers.	- Use rounded-tip ESD plastic tweezers.
	



2) Do NOT touch on the sensitive part of battery when handling

Wrong	Correct
- No touch on the top side(PCM) and bottom side(Jelly roll) of battery	- Hold the left and right side of battery
	

3) Do NOT touch on the battery part when handling Front Assy

Wrong	Correct
- No touch on the battery part when handling Front Ass'y	- Hold the left and right side of Front Ass'y
	

4) Do NOT write anything on the battery with a pen.



Risk factor	Solution
- Writing down on the battery pouch can make damage or scratch.	- No write down or make any mark on the battery pouch with any kind of pen
	



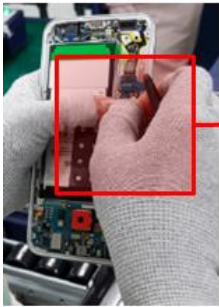
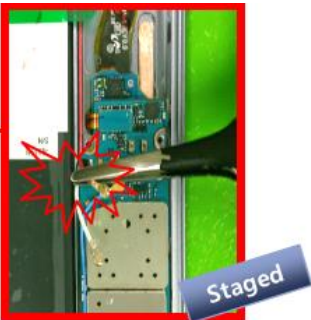

# 1. Safety Precautions

## Cautions for battery handling

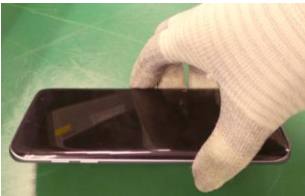





### 5) Prevent damage on the battery pouch by coaxial cable header

Risk factor	Solution
<p>- To place the coaxial cable header on the battery can make damage or scratch.</p> 	<p>- Coaxial cable header should be arranged on the opposite side of battery.</p> 

### 6) Prevent damage by wrong way to use tweezers during arranging coaxial cable

Risk factor	Solution
<p>- Improper way to use tweezers may occur battery damage or scratch during coaxial cable arrangement.</p>  	<p>- Prevent battery damage by wrong way to use tweezers when connecting coaxial cable.</p>  <p>※ Confirm the battery status after connecting coaxial cable</p>

### 7) Prevent damage on the battery by placing direction

Risk factor	Solution
<p>- Placing electric components(include battery) downside can cause scratch/damage by dust</p>   	<p>- Place the display facing down to prevent damage by dust, etc</p>   

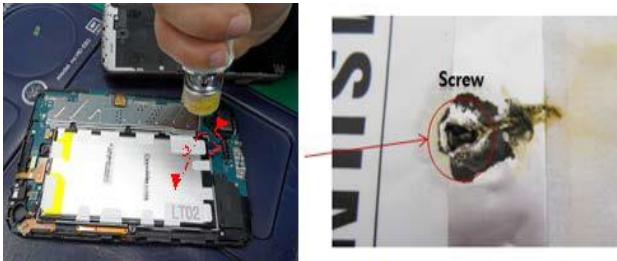
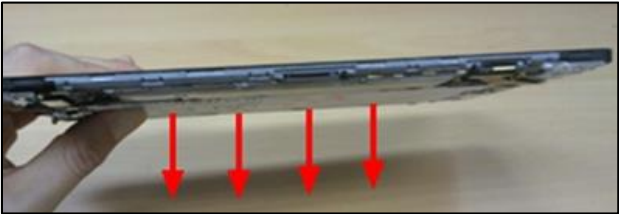
NG

OK

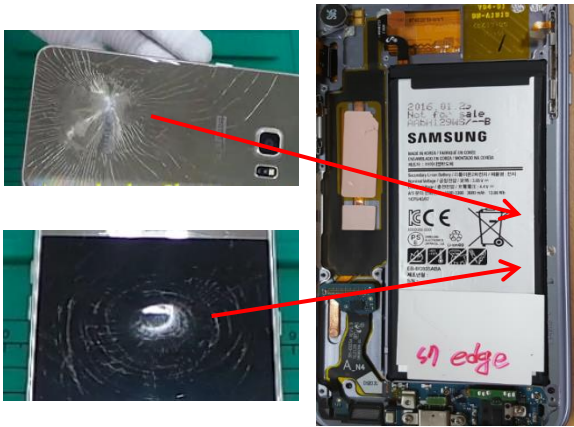












# 1. Safety Precautions

## Cautions for battery handling

8) Check the remained screws or dust before assembly.

Risk factor	Solution
<div>- Screw , Dust, etc can cause damage to the battery after assembly.</div> <div></div>	<div>- Face down the front ass'y/Rear Ass'y before full assembly to remove remained screws or dust.</div> <div>* Must check speaker, motor, etc which have magnetic inside.</div> <div></div>

9) How to detach back cover or OCTA window broken

Risk factor	Solution						
<div>- Broken cover from back cover or OCTA can make damage on the battery pouch.</div> <div></div>	<div>- Use 'Window detaching tape'.</div> <div>- Do NOT touch the battery directly with any tools during removing back cover.</div> <div><table><tr><td><div>Back glass</div></td><td><div>OCTA</div></td></tr><tr><td></td><td></td></tr><tr><td>Window detaching tape (GH02-13515A)</td><td>Disassembly stick (GH81-11926A)</td></tr></table></div>	<div>Back glass</div> 	<div>OCTA</div> 			Window detaching tape (GH02-13515A)	Disassembly stick (GH81-11926A)
<div>Back glass</div> 	<div>OCTA</div> 						
							
Window detaching tape (GH02-13515A)	Disassembly stick (GH81-11926A)						

# 2. Tools & Equipment

## 2-1. Disassembly & Assembly





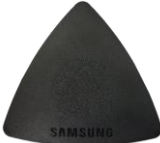
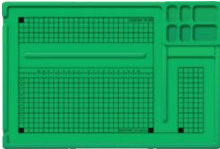




- To ensure proper assembly without damage to the device, use the proper tools and equipment:

Image	Description
	<p><b>AOD (Automatic OCTA Disassembler)</b></p> <ul style="list-style-type: none"><li>- The back-cover or screen module can be disassembled automatically with this AOD tool.</li><li>- For details of AOD, please refer to user guide for AOD at GSPN.</li></ul> <p>※ Pay Attention to Heat Transfer</p>
	<p><b>Press Jig body (Common)</b></p> <ul style="list-style-type: none"><li>- This is required to press back-cover or battery after reassembling.</li><li>- It is an important work to maintain attaching back-cover &amp; water resistance.</li><li>- The torque wheel can be changed by each part.<ul style="list-style-type: none"><li>* wheel for back-cover pressing : 1N force</li><li>wheel for battery pressing : 0.6 N force</li></ul></li></ul>
	<p><b>Press Pad for back-cover (by each model)</b></p> <ul style="list-style-type: none"><li>- This is required to press back-cover for each model.</li><li>- And it should be used with Press jig body.</li></ul>
	<p><b>Press Pad for battery</b></p> <ul style="list-style-type: none"><li>- There are various size of pad for battery press.</li><li>- For detail, refer to jig list document at GSPN.</li></ul>

\* For detailed information, refer to each guide at the GSPN.

# 2. Tools & Equipment

## 2-1. Disassembly & Assembly

Image	Description
	<b>Screwdriver</b> : to fasten or release the screws
	<b>Anti-static Tweezers</b> : to disassemble or assemble the device ※ Do not use metal tweezer near the battery
	<b>Opening Stick</b> (made for Samsung devices) : to disassemble the device
	<b>Opening Tool</b> (made for Samsung devices) : to disassemble the device
	<b>Opening Pick</b> (made for Samsung devices) : to disassemble the device
	<b>Grounded Mat</b> : to protect ESD/cosmetic damage during repair
	<b>Anti-static Gloves</b> : to protect ESD/cosmetic damage during repair
	<b>ESD Wrist Strap</b> : to protect ESD damage during repair
	<b>Dust Blower</b> : to remove the dust
	<b>USB Microscope</b> : to check dust/corrosion inside the USB connector

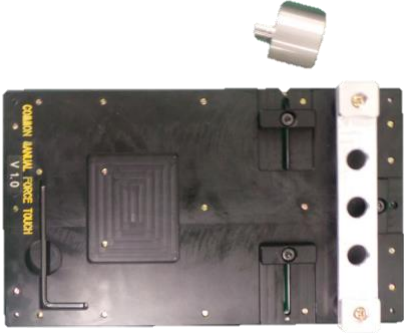
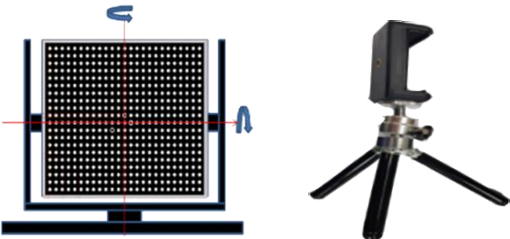
\* For the code of jigs, refer to each guide at the GSPN.



# 2. Tools & Equipment

## 2-2. Calibration

- To ensure proper calibration to the device, use the proper tools and equipment.

Image	Description
	<b>Force touch Calibration Jig</b> <ul style="list-style-type: none"><li>- Only for S8, Note 8, S9, Note 9</li><li>- For detail, refer to the calibration chapter</li></ul>
	<b>Optical Finger Print sensor CAL JIG</b> <ul style="list-style-type: none"><li>- For detail, refer to the calibration chapter</li></ul>
	<b>OPTICAL FINGER PRINT Cal Jig DUMMY</b> <ul style="list-style-type: none"><li>- For detail, refer to the calibration chapter</li></ul>
	<b>ToF calibration Jig Box</b> <ul style="list-style-type: none"><li>- For detail, refer to the calibration chapter</li></ul>
	<b>Multiple Camera Calibration Chart &amp; Camera Holder</b> <ul style="list-style-type: none"><li>- For detail, refer to the calibration chapter</li></ul>





\* For detailed information, refer to each guide at the GSPN.

## 2. Tools & Equipment

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### 2-3. Water Resistance Test

- To ensure proper test of the device, use the proper tools and equipment.

Image	Description
	<b>2Kg Weight and Pad</b> <ul style="list-style-type: none"><li>- Only for measuring water resistance</li><li>- For models with barometer sensor. ex) S series, Note series.</li></ul>
	<b>Sealing tape for WRT test</b> <ul style="list-style-type: none"><li>- To cover the holes of the device ex) Main Mic hole, Sub Mic hole, etc.</li></ul>
	<b>Blue-MLC</b> <ul style="list-style-type: none"><li>- For models without barometer sensor ex) Active models These models have removable battery. Mount the Blue-MLC module inside the phone instead of battery to check Water Resistance performance.</li></ul>
	<b>WRT Test Kit</b> <ul style="list-style-type: none"><li>- For models without barometer sensor ex) S20 FE</li></ul>

\* For detailed information, refer to each guide at the GSPN.



# 3. SW Update (FENRIR)

## 3-1. Preparation

- Fenrir is designed as an ASC/CRC Plug & Play solution offering SVC to provide software updates for Samsung mobile devices and Warranty validation.
- Fenrir installed PC must be connected to the Internet
  - To download S/W binary from the FUS server automatically
  - To check whether any new S/W binary upload in the FUS server. (Fenrir communicates with FUS server for every 2 hours)
  - To deliver device connection and S/W Update history to FUS server for Repair Complete(R/C) validation
- Every Samsung Authorized Service Centers must use Fenrir as a S/W update tool and Repair can be completed based upon the Fenrir connection history and S/W Update stored in the FUS server.
- It means that ASC must do
  - **S/W update** with Fenrir for every repair (S/W Update Mandatory) → HQ will reject R/C when ASC skipped S/W update on the device.
  - Or, **Connect the device** to Fenrir for every repair (Connection Mandatory)
- No Power Up device:
  - For In Warranty jobs, if PBA is replaced, the device must be connected to Fenrir after replacing PBA to log each connection history of the device.
  - For Out of Warranty jobs, details of your process should be discussed with RHQ.
- There are 2 options to save device connection evidence in the FUS server.
  1. Select **S/W Update** : Update device S/W with the latest one.
  2. Select **SVC Connection** : Skip S/W Update and just save device connection history to FUS server.  
ASC can choose this option only if ① customer don't want to update or ② the device already has the latest one.
- What is needed?
  - PC with Window OS 7/8/10(We cannot guarantee to work well with Windows XP and Windows Vista)
  - Recommended Hard Disk Size : Depends on the size and number of S/W binaries  
Europe : over 3TB  
Others : over 1TB(Refer to the next slide for binary size)
  - Internet Connection : over 3Mbps (recommended over 5Mbps)
  - Firewall setting in the ASC Network : open firewall to FUS server URLs  
<http://cloud-neofussvr.sslcs.cdngc.net>, <http://neofussvr.sslcs.cdngc.net>  
+ It is required to send device connection history to the FUS server and to download S/W binary from the FUS server.
  - The device's S/W binaries must be prepared(downloaded) to PC from the FUS server during pilot period.

# 3. SW Update (FENRIR)

## 3-2. S/W Update

Image	Description
	<ol style="list-style-type: none"><li>1. Launch Fenrir by clicking on the icon on the desktop</li><li>2. Input ID &amp; password</li></ol> <p>✖ You need to reset the ID information in case of PC change and format and repair, hard disk change. After finishing all items, complete diagnostics results are displayed on the results screen</p>
<div><div></div><p>Phone info is loading</p></div> <div></div>	<ol style="list-style-type: none"><li>3. Turn on Device &amp; Confirm battery charge is at least 30%</li><li>4. Connect Device to appropriate USB Cable</li><li>5. Select Next to Start the Reflash or it will start automatically in 30 seconds</li></ol>
<div></div> <div></div>	<ol style="list-style-type: none"><li>6. DO NOT DISCONNECT device once started</li><li>7. Status bar will increase as update advances</li><li>8. Select Ok option once reflash is complete</li><li>9 .Disconnect Device from USB Cable</li></ol>

\* For detailed information, refer to each guide at the GSPN.

# 4. Calibration

## 4-1. Background

- The calibration is required after replacing each part of mentioned below.
- Most of calibration is performed with the repair mode of GD(Galaxy Diagnostics).
- Battery cycle count reset, Speaker Calibration and TSP Calibration are performed automatically by GD.
- For details of each calibration item, please refer to Standard guide [SVC-02] Technical Guide at GSPN.

## 4-2. Force touch calibration

- What is the Force Touch?
  - : It's a kind of pressing sensor, so the sensor can recognize the pressing force levels from the user on the screen. Different actions may be operated by the pressing force levels.
- Which case needs the calibration
  - : Specific models (**S8, N8, S9, N9**)
  - The applicable models can be detected automatically by Galaxy Diagnostics.
  - Whenever the back-glass/PBA is reassembled.
- Preparations


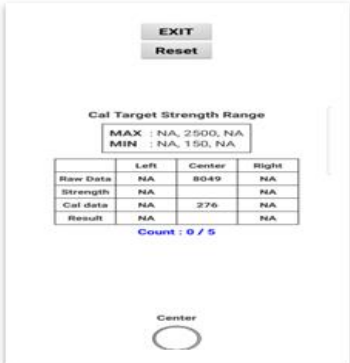

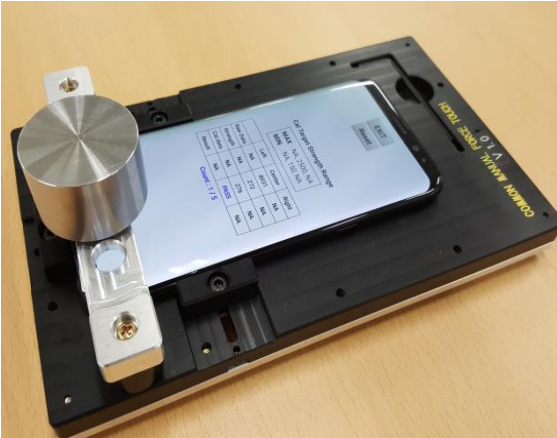
	Galaxy Diagnostics	Device	JIG
Image			
Purpose	Support to enter test mode	Calibration Test Mode of the device	Set the position and weight (250g)

Image	Description
	<ul style="list-style-type: none"><li>- Only for S8, Note 8, S9, Note 9</li><li>① Run the force touch calibration mode with GD.</li><li>② Disconnect USB cable and click the 'start' button on the phone screen.</li><li>③ Put the phone on jig and align the proper position.</li><li>④ Center hole in the screen should be fit to the center hole of jig.</li><li>⑤ Place 250g weigh in the center hole of the JIG and then remove it.</li><li>⑥ After repeating 5 times, test mode will be closed. ( If calibration fails, press the reset button to perform the calibration again.)</li><li>- For details of each calibration item, please refer to Standard guide [SVC-02] Technical Guide at GSPN.</li></ul>

# 4. Calibration

## 4-3. Optical Finger print sensor calibration

- Why it needs?  
: This calibration will ensure optimal performance of the Optical Fingerprint Sensor even in suboptimal conditions which can impact Sensor performance, such as with the presence of dust or poor lighting.
- Which case needs the calibration
  - : SM-A505F / A705F / A805F / A7160 (Model support optical fingerprint CAL)
  - The applicable models can be detected automatically by Galaxy Diagnostics.
  - : Require calibration in case of 1.display, 2.fingerprint sensor, 3.PBA replacement or 4.display and sensor reassembly
- Preparations

Image	Description
	Optical Finger Print sensor CAL JIG (GH81-16872A)  SM-A505, SM-A705, SM-A805
	Optical Finger Print sensor CAL JIG + OPTICAL FINGER PRINT DUMMY (GH81-18830A)  Only Charter is different from existing usage

- How to do the Calibration

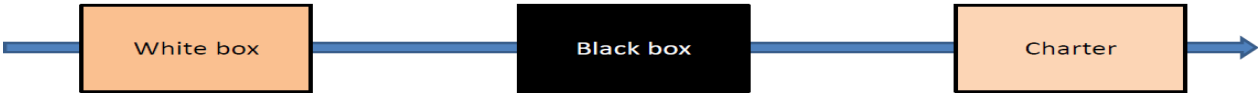
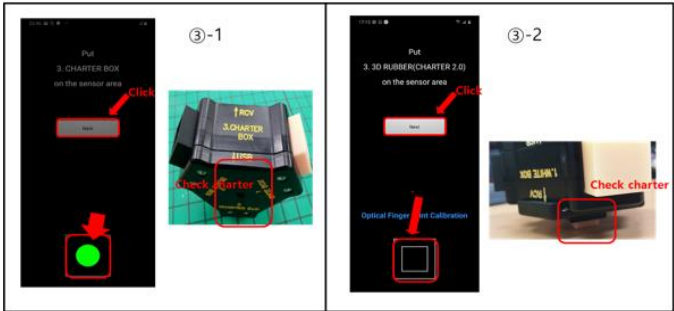
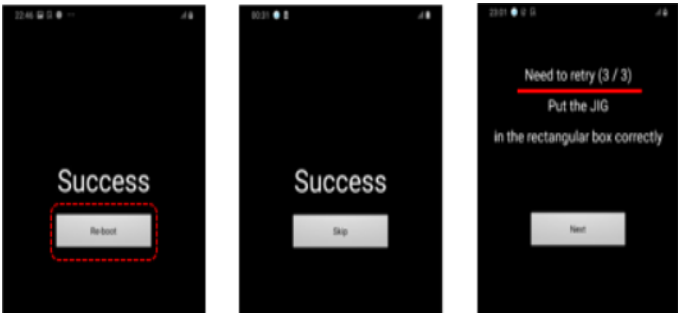


Image	Description
	① 1st - White Box Calibration : Put the white box part of the jig on the circle area
	② 2nd - Black Box Calibration : Put the Black box part of the jig on the circle area

# 4. Calibration

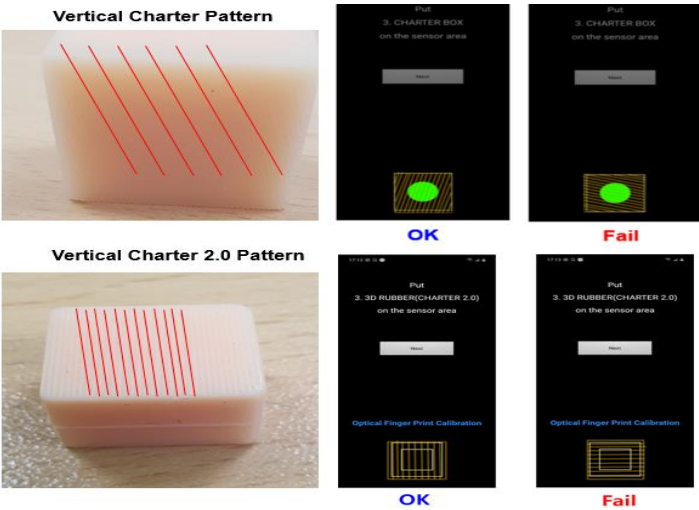
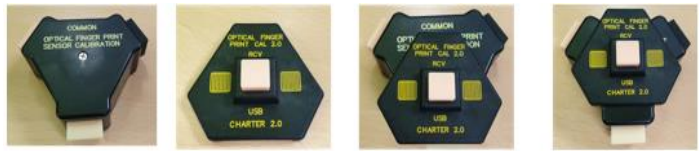
## 4-3. Optical Finger print sensor calibration

- How to do the Calibration

Image	Description
	<p>③-1. When 'charter box' text is displayed on the screen, put the charter part of jig on the sensor area. (circle area)</p> <p>③-2. When '3D Rubber(charter2.0)' text is displayed on the screen, put the charter part of jig on the sensor area. (square area)</p>
	<p>④ Once the calibration process is completed, one of three buttons will display in the calibration UI:</p> <ul style="list-style-type: none"><li>a. Re-boot writes the calibration data to device storage and reboots the device.</li><li>b. Skip moves forward to the next test item when the device is reconnected to the GD PC</li><li>c. Next retries the calibration if the jig was not placed properly on the sensor.</li></ul>

Re-CAL is possible 10 minutes later.

- Precautions


Image	Description
	<p><b>Charter Box Precaution</b></p> <p>: If the pattern is oriented horizontally (left to right), calibration will fail. Ensure that the pattern on the Charter Box is aligned vertically (up and down) in relation to the sensor area.</p>
	<p><b>Charter 2.0 rubber Precaution</b></p> <p>: the CHATER 2.0 can be combined with the existing jig. Check the direction when you use the jig.</p>



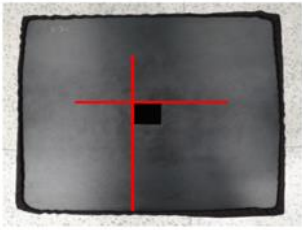
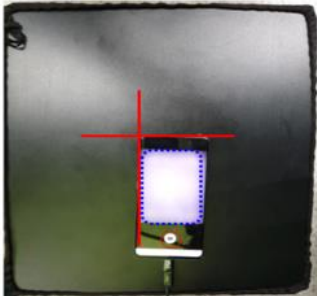
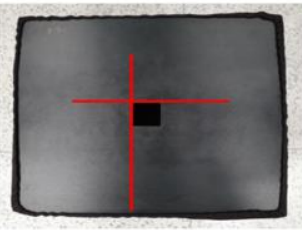

# 4. Calibration

## 4-4. TOF Camera calibration

- **What is the TOF (Time of Flight) Camera?**  
: It is called as the 3D Depth Camera. ToF Camera shoot the IR(Infrared Ray) to Object and then analyze the reflected IR returning time & wavelength, as a result it can check the distance to object from the camera.
- **Why it needs?**  
: After assemble the ToF cam on the phone, the depth value error is increased dramatically. Because of complex different value deviation, such as Voltage / window optical characteristic/inductance etc. So it needs accurate value to compensate the depth error.  
: Using the 300mm height jig box, it can be checked that how much value is deviated for depth information. And the GD apply this error value on the phone to compensate error.
- **Which case needs the calibration?**  
: Specific models (S10 5G, Note 10 series, S20 series, and so on ) The applicable models can be detected automatically by Galaxy Diagnostics.  
: When the camera replaced, (camera performance deviation for each module)  
When the PBA is replaced, (Calibration value is saved on the memory.)
- **Pre-requisite**

Image	Description
	ToF Calibration <a href="#">Jig BOX</a>  SEC CODE : GH81-17058A IMK CODE : 1249318000

### - How to do the Calibration

Image	Description
 	<b>Rear TOF camera calibration</b> ① Check the preview of Rear ToF cam after place the proper position above the jig box. (It should be shown only white paper.) ② Push the camera button on the screen. ( Do not move the phone while processing. )
 	<b>Front TOF camera calibration(only for S10 5G)</b> ① Check the preview of Front ToF camera. ② Push the volume-up key after place the phone on the proper position above the jig box like the picture below. ( Do not move the phone while processing. ) ③ It can be moved after beep alarm sound. (about 5 seconds later)



# 4. Calibration

## 4-5. Digital Hall IC calibration

- **What is the Digital Hall IC ? (for Galaxy Z Flip model)?**  
: Bloom has new feature which is “FREE STOP” with special hinge. Some Apps UI will be changeable with folding angle. Folding angle could be checked by Digital Hall IC. Digital Hall IC calibration is required when its replacement to set the values for various folding angles.



- **Which case needs the calibration?**  
: Specific models (Galaxy Z Flip)  
The applicable models can be detected automatically by Galaxy Diagnostics.  
: When the display is replaced and when the PBA is replaced,

- **How to do the Calibration**

Image	Description
<div><div><div><div><div>acttest@samsung.comacttest</div><div></div><div>Digital Hall IC Cal</div><div>Fold a device 2 Times</div></div></div><div><div><div>acttest@samsung.comacttest</div><div></div><div>Digital Hall IC Cal</div><div>Fold a device 2 Times</div></div></div><div><div><div>acttest@samsung.comacttest</div><div></div><div>Digital Hall IC Cal</div><div>Fold a device 2 Times</div></div></div><div><div><div></div><div>Close</div></div><div><div></div><div>Open</div></div></div></div><div><p>2 times</p></div></div>	<div><div>① Digital Hall IC Calibration is available with Galaxy Diagnostics.</div><div>② Folding operation is required 2 times.(Closed ↔ Opened) Certainly close the device and fully open the device (2 times)</div></div>

# 4. Calibration

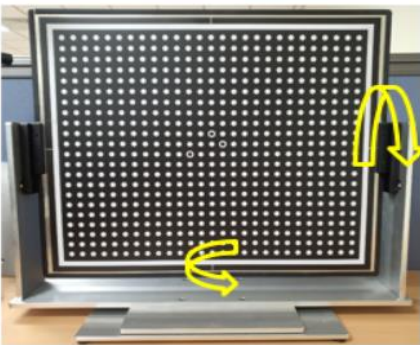



## 4-6. Multiple camera calibration

- **Why it needs the calibration?**
  - : Previously the multiple cameras (Wide/Ultra/Tele/ToF..) are assembled to the device as a 'module'. The module means those cameras are attached to each other physically like a part.
  - : But in some models (ex-S20/N20/S21 series), the cameras are divided physically and each camera has a different direction angle physically by the assembly status & mechanical deviation.
  - : So it needs to compensate for the angle & position by Software to align the deviation.
  - : With the special rotating chart jig, the device can figure out that how much value is deviated for angle & position.
  - And the calibration apply this error value on the phone to compensate error.



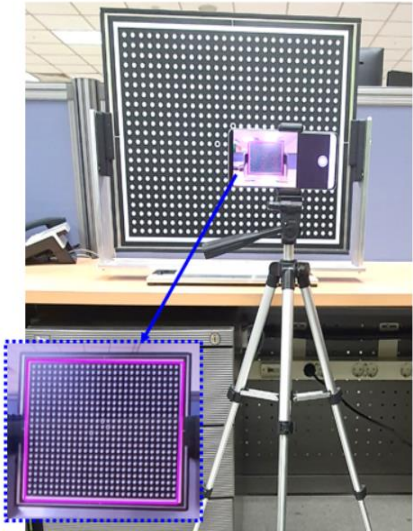
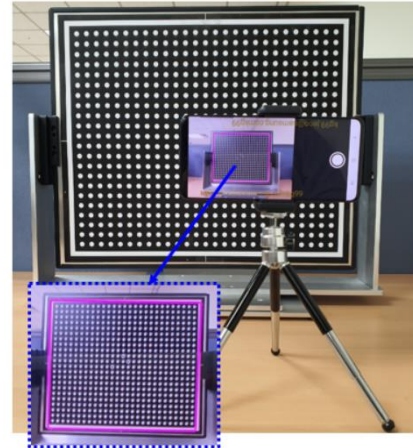
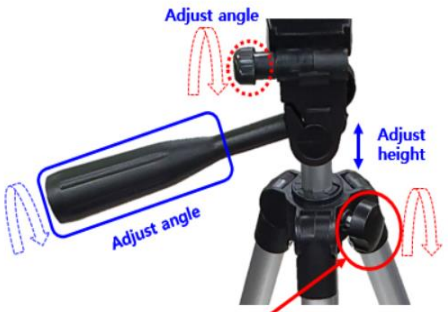
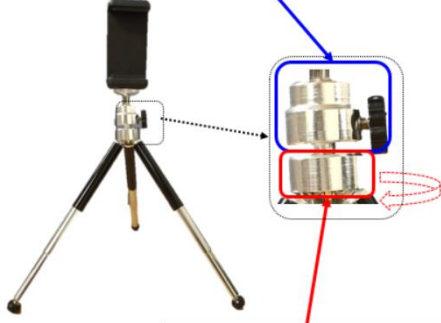
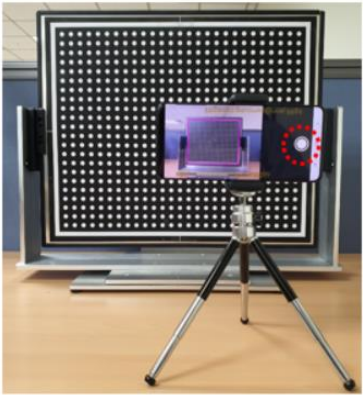

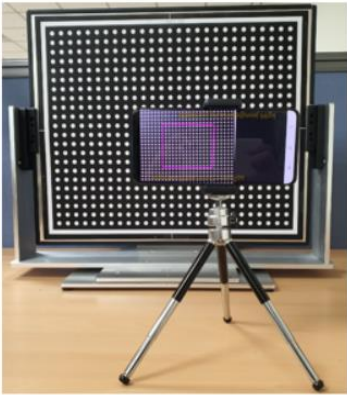
- **Which case needs the calibration?**
  - : Specific models (S20/N20/S21 series and so on )
  - The applicable models can be detected automatically by Galaxy Diagnostics.
  - : When the rear camera or Main PBA is reassembled,
    - Front Ass'y (OCTA) replacement
    - Main-PBA replacement
    - Rear camera replacement
    - Rear camera or main PBA are just reassembled, (even if no replacement)
  - : No need to calibrate below parts replacement
    - Back-glass, SUB-PBA, Rear case, Front Camera, Battery, RCV, Motor

### - Pre-requisite

Camera chart rotating Jig	Tripod to hold the smart phone * Local market phone-tripod can be used.		Galaxy Diagnostic
 <p>Code : Refer to Jig List</p>	 <p>[ Mini tripod ] ( height : 25 cm )</p> <p>Code : GH81-18499A</p>	 <p>[ Tall tripod ] ( height : 110 cm )</p> <p>Code : GH81-18946A</p>	

## 4-6. Multiple camera calibration

- How to do the Multi Camera calibration

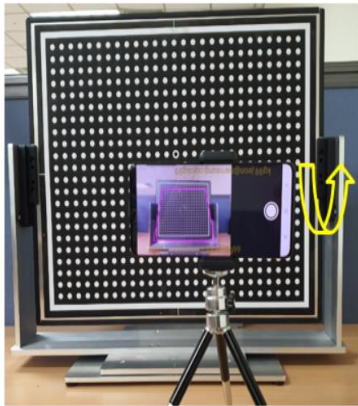

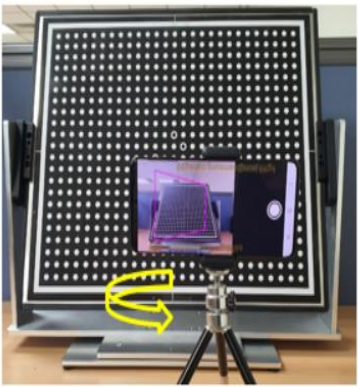

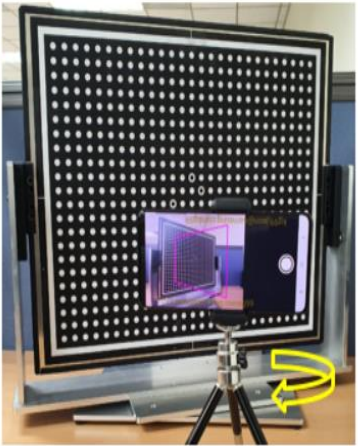

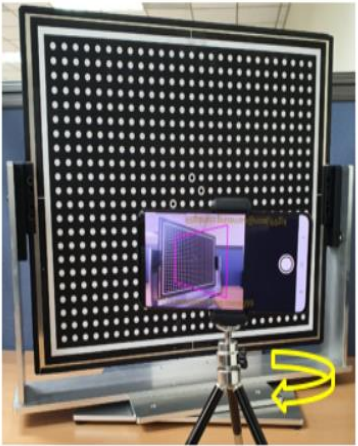

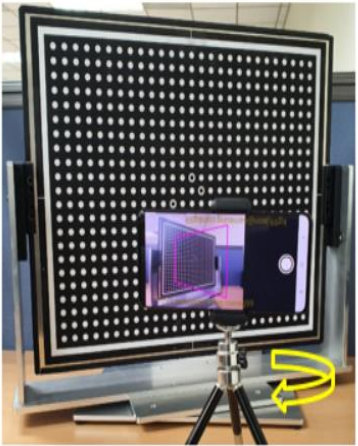

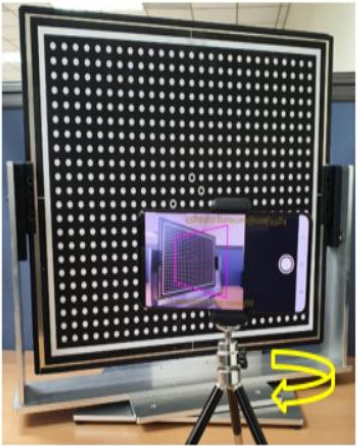

Image	Description
<div data-bbox="45 348 454 876"></div> <div data-bbox="45 907 454 1353"></div> <div data-bbox="468 379 911 689"></div> <div data-bbox="496 710 915 783"><p>Turn the knob to hold the height. (Adjust the height after turn it to the clockwise and then turn it to the counterclockwise to hold it.)</p></div> <div data-bbox="486 803 925 872"><p>※ <b>Note</b></p><ul style="list-style-type: none"><li>- Do not place the chart under the <b>direct sunlight</b>.</li><li>- Do not place the kinds of <b>mirror</b> beside the chart.</li></ul></div> <div data-bbox="511 893 915 917"><p>Adjust the holding angle and turn the knob to lock it.</p></div> <div data-bbox="475 928 911 1249"></div> <div data-bbox="639 1249 915 1280"><p>Turn the wheel to adjust the height.</p></div> <div data-bbox="486 1290 915 1359"><p>※ <b>Note</b></p><ul style="list-style-type: none"><li>- Do not place the chart under the <b>direct sunlight</b>.</li><li>- Do not place the kinds of <b>mirror</b> beside the chart.</li></ul></div>	<div data-bbox="961 337 1378 638"><p>① Run the multi cam calibration mode with the Galaxy Diagnostics.</p><p>② Hold the phone on the tripod and align the guide box on the display to the chart white color outline.</p></div> <div data-bbox="961 1394 1382 1663"><p>③ Touch the shooting button. The capturing will be conducted automatically twice. (First shoot is normal capture, second shoot is zoom capture.)</p></div> <div data-bbox="996 1705 1335 1777"><p>※ Do not move/touch the phone while processing.</p></div>
<div data-bbox="45 1415 404 1808"></div> <div data-bbox="175 1819 275 1844"><p>First capture</p></div> <div data-bbox="439 1591 546 1643"></div> <div data-bbox="575 1415 918 1808"></div> <div data-bbox="689 1819 818 1844"><p>Second capture</p></div> <div data-bbox="54 1871 849 1933"><p>※ Do not move/touch the phone between first capture and second capture. The shooting will be conducted automatically <b>twice</b>.</p></div>	



# 4. Calibration

## 4-6. Multiple camera calibration

- How to do the Multi Camera calibration

Image		Description
		<p>④ If guide box shape is changed to other angle, rotating the chart with same angle. And the touch the capture button.</p> <p>⑤ If the error pop-up window appears, try again from the beginning.</p>
		
		
		
		
		

# 5. Quality Check (Galaxy Diagnostics)

## 5-1. Preparation



- Samsung’s official mobile phone diagnostics tool.
- A kind of PC program, so it needs the Personal Computer.

	Minimum system requirements	Recommended system requirements
OS	Windows 7(32bit)	Windows 7,8,10(32/64bit)
CPU	Pentium 1.8GHz	Intel Core i5 3.0GHz or higher
Memory(RAM)	1GB	2GB
Screen Resolution	1280 x 800	1280 x1024
Graphics Card	Intel HD Graphics NVIDIA GeForce 400 series AMD Radeon HD 4000 Series	Intel HD Graphics or higher NVIDIA GeForce 400 series or higher AMD Radeon HD 4000 Series or higher
Software Prerequisites	Microsoft .NET Framework 4.5 Samsung USB Driver Samsung Kies	Microsoft .NET Framework 4.5 Samsung USB Driver Samsung Kies
USB Hub	Maximum 10 Port USB Hub (Power supported USB Hub)	More than 5 Port USB Hub X 2 devices

- It is executable only for authorized G-SPN users and can be downloaded from G-SPN.
- All items categorized by 10 typical symptoms and 2 device types (Wearable, Hearable).
- Login GD to get and install a valid certificate on the PC.



Please login first to use the Galaxy Diagnostics.

ID

PW



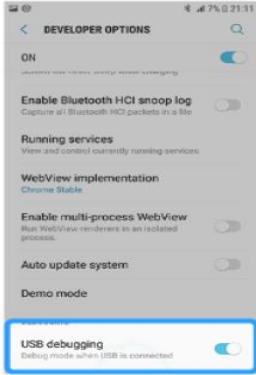

No certificates.  
Please login and request new certificates.

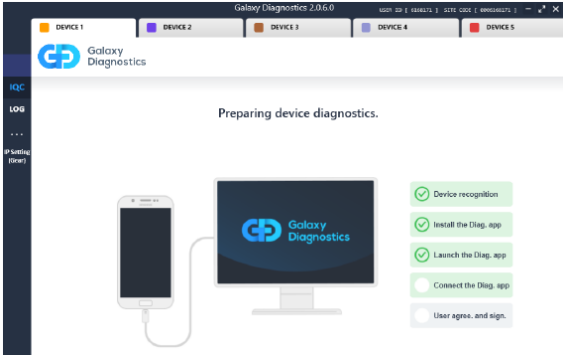

\* For detailed information, refer to each guide at the GSPN.

# 5. Quality Check (Galaxy Diagnostics)

CONFIDENTIAL

## 5-1. Preparation

Image			
<div>1</div> 	<div>2</div> 	<div>3</div> 	<div>4</div> 
Select [About phone] from the settings, then [Software info].	From the list in [Software info], tap [Build number] five times in quick succession.	Go to [Developer options], and select [USB debugging].	Tap "Always allow from this computer", then [OK].

Description	
<b>Enable USB Debugging in the mobile device.</b> <ul style="list-style-type: none"><li>- Run Galaxy Diagnostics from GSPN menu(IQC or OQC) on the PC</li><li>- Ensure that the Wi-Fi status is OFF</li><li>- Connect the device with PC through USB cable</li></ul>	
Image	Description
	<b>Connect the device with GD PC through the USB</b> <ul style="list-style-type: none"><li>- Select the "Start diagnostics" button</li></ul>
	<b>User must enter the OTP(Not MOTP)on the device.</b> <ul style="list-style-type: none"><li>- If user fails OTP verification in 5 consecutive times, GD will be automatically uninstalled.</li></ul>

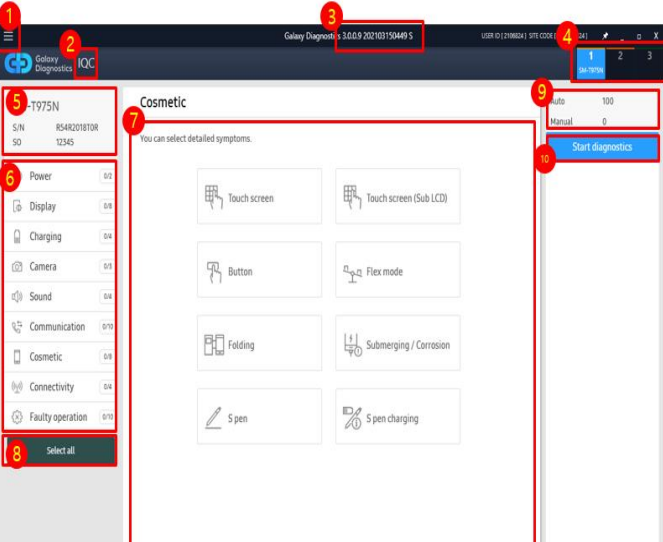
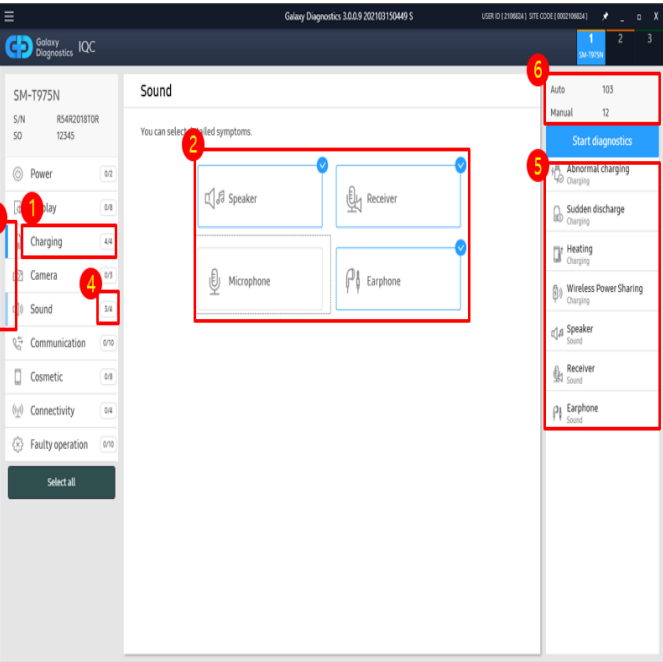
\* For detailed information, refer to each guide at the GSPN.



# 5. Quality Check (Galaxy Diagnostics)

## 5-2. IQC(Incoming Quality Check) Mode

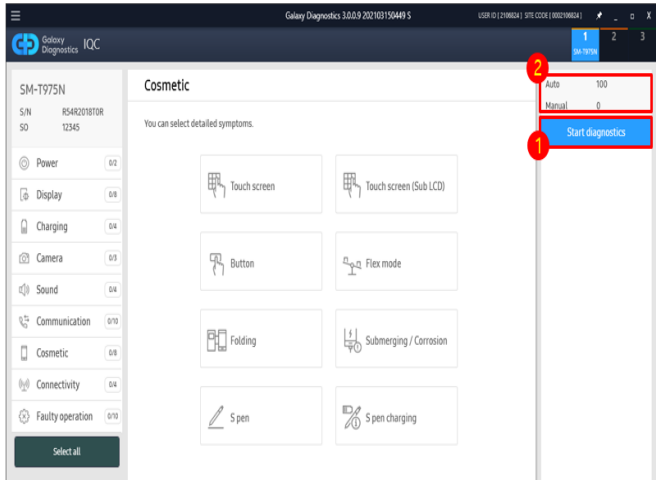
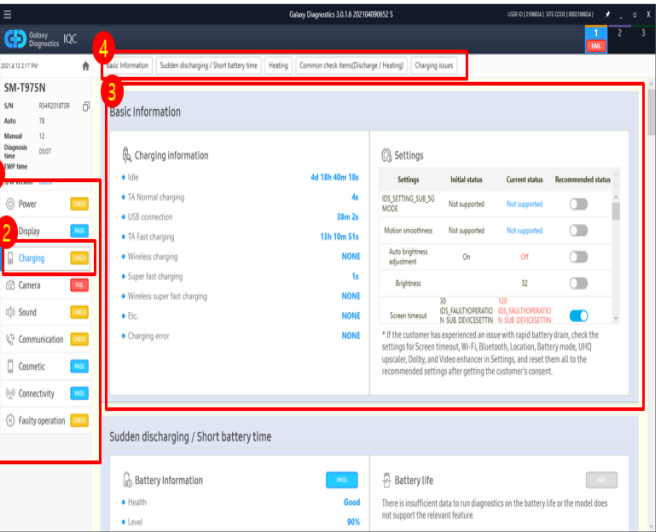
- There are 9 predefined diagnostics main items which come from the standardized customer symptom codes- Caution.
- More than 80 sub-items are selected as mandatory based on the IQC Profile in G-SPN; the user cannot deselect or skip these items.
- The user can select additional diagnostic items based on the reported symptom(e.g. Input, Display etc.)
- If additional items are selected, the user can see all categories on the right side of the GD UI .

Image	Description
	<div><input type="checkbox"/> <b>Basic test</b></div> <div><ol style="list-style-type: none"><li>1. Settings menu(Languages, User role, GD error log capture etc.).</li><li>2. Test types(IQC / OQC).</li><li>3. GD version.</li><li>4. Multiple device selection tab.</li><li>5. Device information.</li><li>6. Customer symptom(Main category).</li><li>7. Customer symptom(Sub category).</li><li>8. Select all customer symptom button.</li><li>9. Test information(# of automatic and manual test items).</li><li>10. “Start diagnostics” button to start the test.</li></ol></div>
	<div><input type="checkbox"/> <b>Customer symptom selection in detail</b></div> <div><ol style="list-style-type: none"><li>1. User can select customer symptom from the main category.</li><li>2. User can also partially select customer symptom from the sub category.</li><li>3. The bar in left side of main category item has different color between fully selected and partially selected items.</li><li>4. User can find the # of selected customer symptom from the sub category.</li><li>5. User can find the whole list of selected customer symptom.</li><li>6. Test information will be updated automatically as you select customer symptom.</li></ol></div>

\* For detailed information, refer to each guide at the GSPN.

# 5. Quality Check (Galaxy Diagnostics)

## 5-2. IQC(Incoming Quality Check) Mode

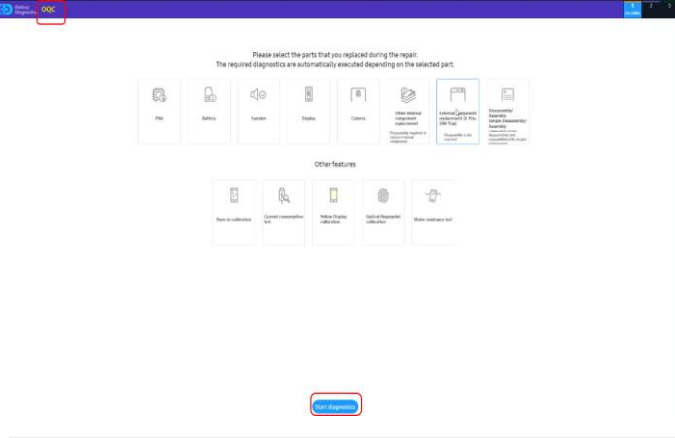
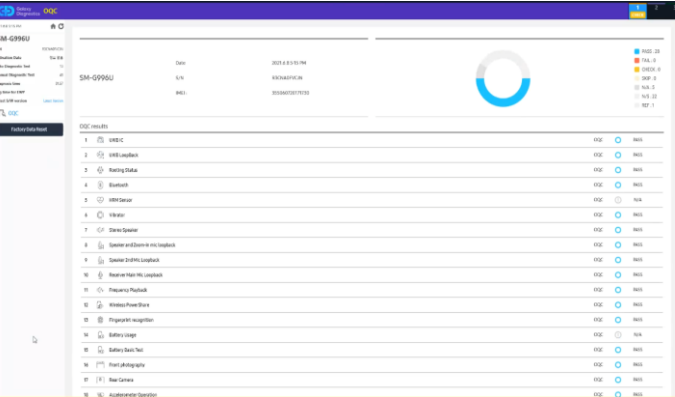
Image	Description
	<div><input type="checkbox"/> “default test” if user skip customer symptom selection</div> <div><div>1. User can select Start diagnostics button without any selection of customer symptom.</div><div>2. Then the default test will be started, user can find the # of test items and types(automatic and manual types).</div></div> <div>※ Default test items are managed by G-CIC server per each country.</div>
	<div><input type="checkbox"/> Result groups and shortcuts to the groups</div> <div><div>1. The test result is displayed on the left side of the Result Screen with main category of the customer symptom.</div><div>2. When user select a item, the detail test result will be displayed on the right side of the Result Screen.</div><div>3. The related test results are grouped(result groups) and separated by lavender colored box.</div><div>4. And there are shortcuts to each result group.</div></div>

\* For detailed information, refer to each guide at the GSPN.

# 5. Quality Check (Galaxy Diagnostics)

## 5-3. OQC(Outgoing Quality Check) Mode

- In OQC mode, users cannot add or remove test items.
- Diagnostics items are automatically selected based on the OQC profile in G-SPN.

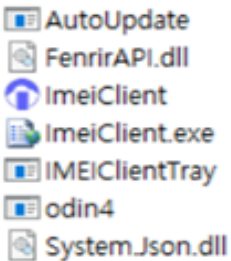
Image	Description
	<p>Select the parts that you replaced during the repair.</p> <p>The required diagnostics are automatically executed depending on the selected part.</p> <p>After selecting items, press “Start diagnostics”</p>
	<p>After finishing all items, complete diagnostics results are displayed on the results screen</p>

\* For detailed information, refer to each guide at the GSPN.

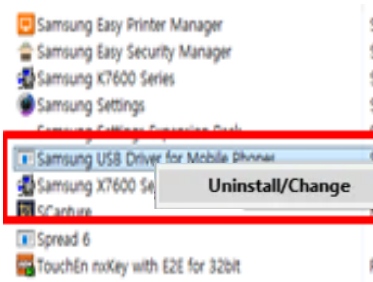
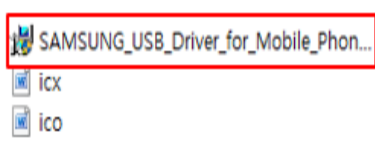
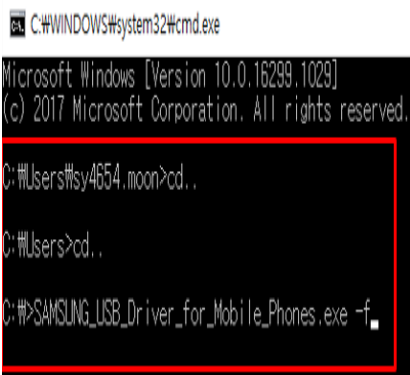
# 6. IMEI Writing

## 6-1. Required Tools and Setting

- ‘IMEI Client’ file download


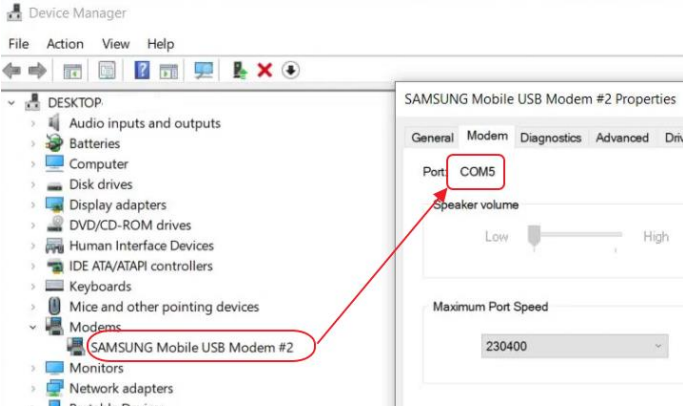
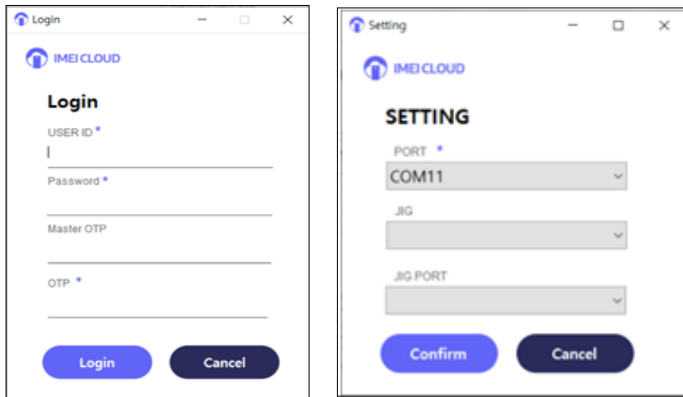

Image	Description
	<p>Download IMEI Client GSPN with internet browser</p> <p>Download Address: <a href="https://api.secmobilesvc.com/client/GSPN.zip">https://api.secmobilesvc.com/client/GSPN.zip</a></p> <p>※ This is file contents of “IMEI Client GSPN” for ASC</p>

- Precondition

Image	Description
	<p>1. Install Fenrir on your Local PC. (Mandatory)</p> <p>(1) Download the latest S/W for the model via Fenrir.</p> <ul style="list-style-type: none"><li>- The S/W will be saved to security area on your local PC.</li><li>- This S/W could be loaded on IMEI Cloud Program to be downloaded.</li></ul>
	<p>2. Install Samsung USB driver again to fix USB COM port. (Optional)</p> <p>(1) Remove installed “Samsung USB driver for Mobile Phones” first by control panel</p> <ul style="list-style-type: none"><li>- How to : Control Panel &gt; Remove or change a program &gt; Remove after find the USB driver</li></ul>
	<p>2. Install Samsung USB driver again to fix USB COM port. (Optional)</p> <p>(2) Download Samsung USB driver from Samsung Web Site and locate it on C drive.</p>
	<p>2. Install Samsung USB driver again to fix USB COM port. (Optional)</p> <p>(3) Run “CMD” window and Set to the “C: \”</p> <p>(4) input “SAMSUNG_USB_Driver_for_Mobile_Phones.exe -f” and press ENTER key.</p> <p>“-f” is the option to fix USB COM PORT Number on local PC.</p> <p>(5) Wait one minute and Driver will be installed automatically. If you don’t use this option, USB COM PORT number will be changed for each model.</p>

# 6. IMEI Writing

## 6-2. How to do the IMEI WRITING

Image	Description
	Pre-requisite : USB Cable & PC
	<p>Please attach the mobile phone with USB cable, than you may see the COM port number in device manager</p> <p>Run “IMEI Client”</p>
	<p>Input GSPN ID / PW / Master OTP / OTP and push the button “Login”</p> <p>Set the COM port number and select JIG and JIG com port.</p> <p>In case of using S03 JIG or U30X, instead of USB cable, than you may set the JIG type and port number.</p>
	<p>Input IMEI and push “IMEI Write” and “Fenrir D/L” and “IMEI check”.</p> <p>※ The writing order is the same as the New Writing Process.</p> <p>- New Writing Process : IMEI Write &gt; Fenrir download &gt; IMEI check</p>

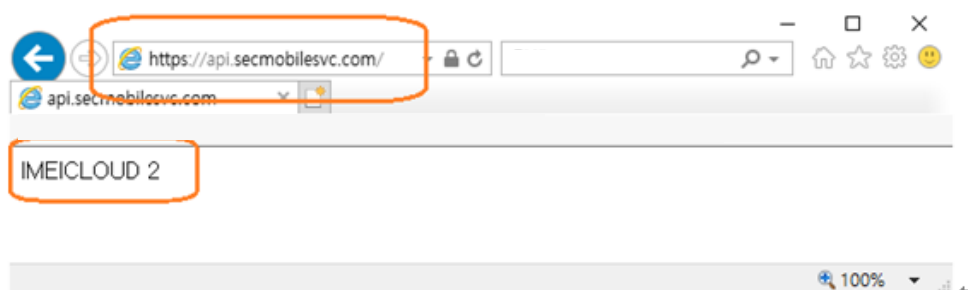
# 6. IMEI Writing

## 6-3. Troubleshooting

- ① Firewall must be disabled to "https://api.secmobilesvc.com" (Port 80, 443)  
IMEI Client program communicate with this address.

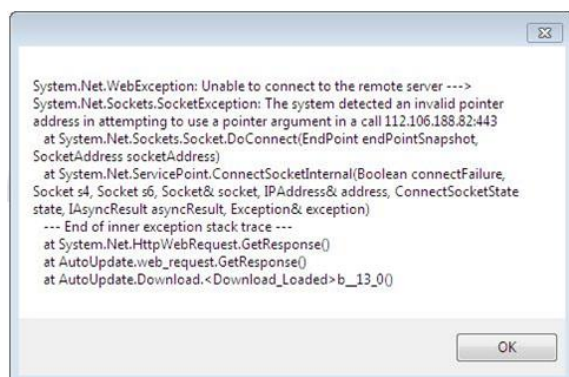
※ This step can check firewall.

- input Internet Explorer address field with "https://api.secmobilesvc.com/" and press enter.
- You may see the text "IMEICLOUD 1" or "IMEICLOUD 2" if firewall opened



- ② If you see this message pop-up when automatical update, it means the port 443 blocked by firewall.

Please open your firewall to the IP 112.106.188.82 for 443 port.



- ③ COM port must be opned to communicate with mobile phone.  
Some firewall software block COM port, it makes IMEI write always fail.
- ④ IMEI Client cannot open COM port after re-connect USB cable with several phone.
  - Cause : The COM port number is newly assigned whenever a new terminal is connected.
  - Solution : Please double-click the file "Registry\_PortFix\_V003.reg" file will add the port-fix registry. And please reboot PC. (Separate attachment file)



# 7. Water Resistance Test

## 7-1. Required Tools and Setting

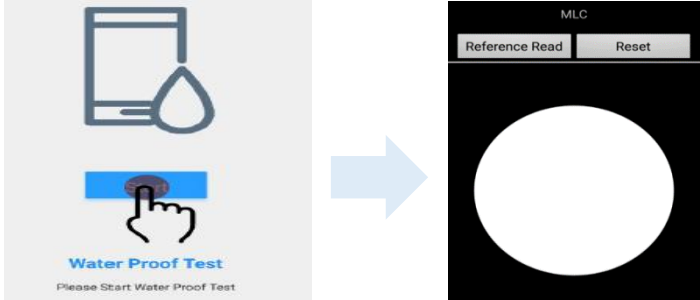



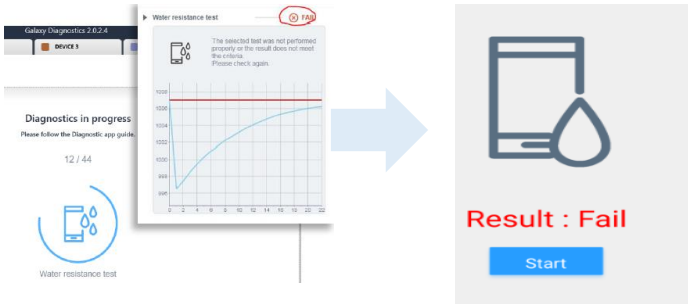
Item	2Kg Weight	Support pad	Sealing tape	PC  (Galaxy Diagnostics)
Picture			  Different by model	<div>Diagnostics in progress Please follow the Diagnostic app guide.</div> <div>12 / 44</div>  Water resistance test
Item	Blue MLC & BT Dongle & BT PGM (For Active series which has removable battery)		WRT TEST KIT (Models which doesn't have the barometer sensor. ex:S20 FE)	
Picture	<div> </div> <div> BlueSoleil (BT dongle program)</div>			

Before starting water resistance test, sealing points of device should be blocked by sealing tape. Normally, mic hole and main camera part must be blocked, however it depends on models. Ensure that the first step of water resistance test is to seal the sealing points. (Check the SVC TECH INFO document by model.)



# 7. Water Resistance Test

## 7-2. How to test with 2kg weight (for models which have Barometer , ex- S21/N20/S20)

Image	Description
	① Check all sealing points of device are blocked, and enter to test mode by the Galaxy Diagnostics.
	② Open IF cover or SIM tray, and measure the reference value after putting the device on the support pad. (Do not touch device during measuring)
	③ Put the weight on the white circle and then close the IF cover or SIM tray.
	④ Remove the weight from the device. Then, it will start to measure automatically. (Remove the weight at least over 3 seconds after closing the IF cover or SIM tray. Also, do not touch device during measuring.)
	⑤ The result will be displayed on the PC & Phone Screen, Pass or Fail.

# 7. Water Resistance Test

## 7-3. How to test with 2Kg weight & Blue MLC+BT dongle

(For Active series which has removable battery, ex - Tab Active3,X-Cover series, etc )

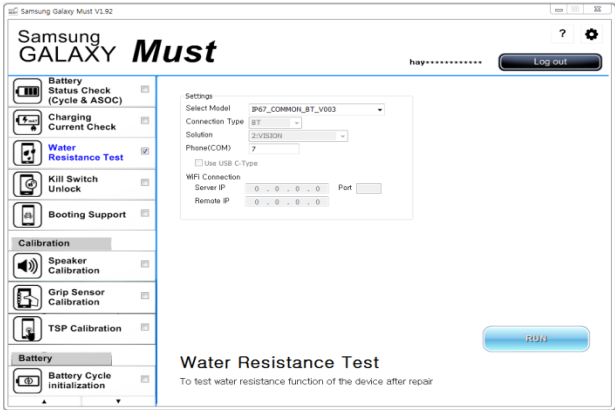



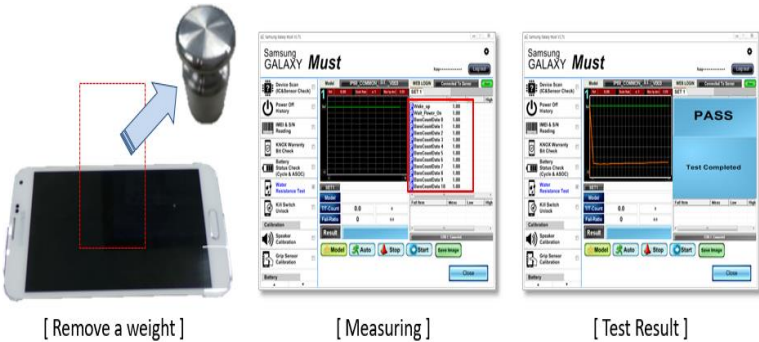
Image	Description
<div><div><div><div>Reset Key (Press for 3sec)</div><div>Power Switch (On ↔ Off)</div></div><div><div>Charging connector</div></div></div><div><div>LED</div><div>- On : Blue Flash - Off : Red Flash - Paring : Blue - Charging : Red</div></div><div><div><div>Blue-MLC ( Water Resistance Test )</div><div>Model : SWR-100 Mobile / DMC RAD Center</div></div></div><div><div><div>Type: Unknown Status: Idle Bluetooth Address: 13:02:22:00:12:53 Double-click to search Bluetooth devices Right-click to get more options</div><div>BT: 1253</div></div></div></div> <p>✖ The 4 numbers on the Blue MLC indicate the last 4 numbers of BT address.</p> <div><div><div>BlueSoleil</div><div>The solution for opening BlueSoleil c</div></div><div><div>BlueSoleil</div><div>BlueSoleil.com</div></div><div><div>SM-S9000V</div><div>Minwoo-PC</div><div>Connected</div></div></div>	<p><b>[Paring Blue MLC with PC ]</b></p> <p>① Power on Blue MLC and standby paring</p> <p>a. Turn left the power switch →</p> <p>b. Press reset for 3 seconds to newly pair with PC →</p> <p>c. Blue LED will turn on constantly for paring standby</p> <p>② Paring Blue MLC with PC via BT dongle</p> <p>a. Double click on the yellow circle in the middle of BlueSoleil window to turn on the BT dongle.</p> <p>b. Program will find all BT devices around PC. 'P sensor' means the Blue MLC. In case 'P sensor' is not shown, find a Blue MLC with reference to BT address.</p> <p>c. Click the right button of mouse on the P sensor, and select 'Pair' to pair with Blue MLC.</p> <p>d. Input '0000' in the paskey and click OK.</p> <p>e. Click the right button of mouse on the P sensor, and select 'Connect Bluetooth Serial Port'.</p> <p>f. Finally, Check if Blue MLC is connected to BT dongle.</p>
<div><div><div><div>BT Antenna</div><div>Separation</div></div><div>PCB Area</div></div><div><div><div>NG</div><div>Blue-MLC ( Water Resistance Test )</div></div><div>NG</div></div></div> <p><b>[ Important ]</b> Bluetooth Antenna in Blue MLC is required to a certain distance from PCB area in the mobile phone.</p>	<p><b>[ Test Procedure ]</b></p> <p>① Place Blue MLC on the battery part of device.</p> <p>- Place on the printed side facing up on the battery part.</p> <p>- BT antenna in Blue MLC should be located on the right side of battery space as shown below.</p>

\* For detailed information, refer to each guide at the GSPN.

# 7. Water Resistance Test

## 7-3. How to test with 2Kg weight & Blue MLC+BT dongle

(For Active series which has removable battery, ex - Tab Active3,X-Cover series, etc )

Image	Description
	<div>② Check all sealing points of device are blocked.</div> <div>③ Run the 'Galaxy Must' and log in. To log in, tester should be GSPN user and ID/PW/OTP are required.</div> <div>④ After login, 'Water Resistance Test' option is activated. Select the 'Water Resistance Test', set the BT settings, and then click 'Run' button.</div>
	<div>⑤ Press 'Auto' button then press 'Start' button.</div>
 <p>Make small gap between back cover and rear.</p>	<div>⑥ When the message 'Open covers for reference read' is shown, open battery cover after putting the device on the support pad and then press 'Confirm' button. (Do not touch device until next message is shown.)</div>
	<div>⑦ When the message 'Close the cover. Remove the weight after closing this pop up' is shown, place a weight on the device and close battery cover. After that press 'Confirm' button. (The device should be still placed on the support pad.)</div>
 <p>[ Remove a weight ]                      [ Measuring ]                      [ Test Result ]</p>	<div>⑧ When the message is closed, remove the weight. It measures the leakage value automatically for 20 seconds, and then it will show the test result - Pass or Fail – when the test is completed. (The device should be still placed on the support pad, and do not touch the device during measuring.)</div>


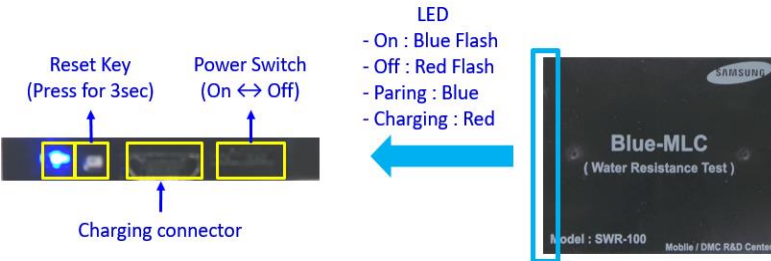



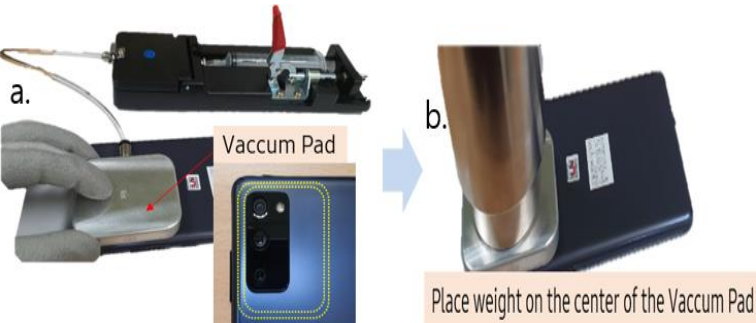
\* For detailed information, refer to each guide at the GSPN.



# 7. Water Resistance Test

## 7-4. How to test with WRT TEST KIT & Blue MLC+BT dongle

(Models which doesn't have the barometer sensor. ex - S20 FE, Watch 3/4 )

Image	Description
<div></div>	<p><b>[Pairing Blue MLC with Phone]</b></p> <p>① Power on Blue MLC and standby pairing</p> <p>a. Turn left the power switch</p> <p>b. Press reset for 3 seconds to newly pair with Phone</p> <p>c. Blue LED will turn on constantly for pairing standby</p> <p>② Pairing Blue MLC with the phone</p> <p>a. Do BT searching, Press "P sensor"</p> <p>b. Enter pin "0000"</p> <p>c. Blue LED will turn on constantly for pairing standby</p>
<div></div>	<p><b>[SET WRT JIG]</b></p> <p>① Insert Blue MLC into the WRT JIG</p> <p>a. Insert the Blue MLC into Case</p> <p>b. Close the case cover</p> <p>c. Set the Lever Up</p>
<div></div> <p>① Main mic hole      ② 2<sup>nd</sup> mic hole</p>	<p><b>[DO TEST]</b></p> <p>① Check Sealing points for each device and Close them with sealing tapes.</p> <p>Please check sealing point for Mic. The hole location for mics may be different for each model, Please refer to SVC guide or Disassembly-Assembly guide for them.</p>
<div><p>a. Place Vacuum Pad on Camera area for device back side.</p><p>b. Place Weight on the center of the Vacuum Pad.</p><p>※ Caution: Check sealing status with Rubber side</p></div>	<p>② Place Vacuum Pad on Device Camera area</p> <p>a. Place Vacuum Pad on Camera area for device back side.</p> <p>b. Place Weight on the center of the Vacuum Pad.</p> <p>※ Caution: Check sealing status with Rubber side</p>



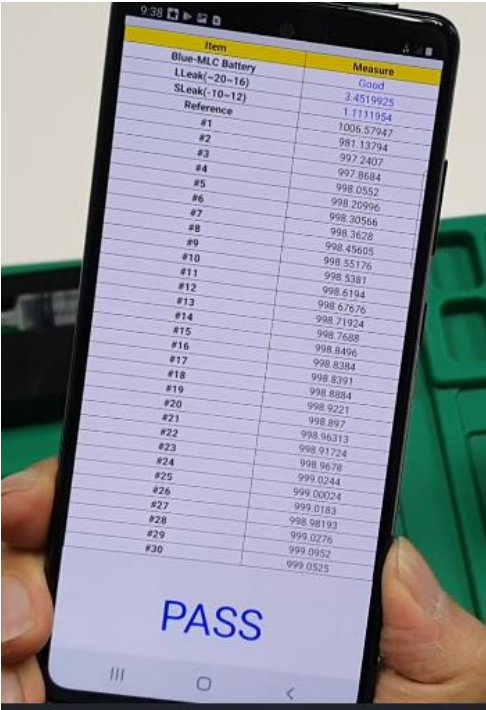
\* For detailed information, refer to each guide at the GSPN.



# 7. Water Resistance Test

## 7-4. How to test with WRT TEST KIT & Blue MLC+BT dongle

(Models which doesn't have the barometer sensor. ex - S20 FE, Watch 3/4 )

Image	Description
	<p><b>[DO TEST]</b></p> <p>③ Run GD and Start Water Resistance Test.</p> <p>a. Press volume key to measure Reference value of room air pressure. When the measuring is completed (it takes about 3 seconds), you can hear “Ding Dong~” sound.</p> <p>b. Make Lever DOWN to start Test. It takes 30 seconds and beep sound rings every seconds while test.</p> <p>c. Check the result by Galaxy Diagnostics.</p> <ul style="list-style-type: none"><li>- Pass or Fail</li><li>- The result and information will be displayed on device display.</li></ul>
<p>Press volume key to measure Ref value of air pressure.</p> 	
<p>After hearing sound “Ding Dong~” → lever DOWN to start Test</p>	
	

\* For detailed information, refer to each guide at the GSPN.