



# Test Instruction - Electrical

Applicable for W950i and W950c

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# 1 Abstract

This document describes the test procedure for the Electrical repair package.

# 2 Test Procedure

To verify all components within the Electrical repair package, all tests must be performed.

# 3 Test flow

If the phone passes these tests without any failures, it is OK to return it to the customer.

If there are any failures, the phone must be repaired according to the troubleshooting guide or sent to a higher repair level.

## 3.1 Software Update

Update to latest signalling software and run the service activities software from EMMA III.

### 3.1.1 Verify Software Version

**NOTE! Remove SIM-card before testing.**

To verify if the phone needs new software, you have to check the Software Version in the phone. Current Software Versions are checked through the following steps:

1. Start up the phone.
2. Enter the sequence **↑\*↓↓↓\*↓↓\*** by means of the Jog Dial (**↓↓↑**) and by pressing (**\***) on the keyboard
3. Select Service info.
4. Select SW Information.
5. Check the file revisions on the display.
6. Press OK to return to the Service info menu.

### 3.1.2 Update Software Version

Update the software in the phone by doing the following steps:

1. Make sure that the phone's battery is fully charged or use a battery eliminator. Connect correct flash cable and interface according to the Installation instruction.
2. Logon to the EMMA III server, and follow the instructions.



## 3.2 Go/No-Go Test

**NOTE!** For testing the GSM / WCDMA part use instrument Yokogawa VC 230.

### 3.2.1 GSM and WCDMA part

If all measurements are approved, this will be confirmed. If any faults are discovered, this will be presented either on the screen. Repair the unit according to the Troubleshooting guide or send the phone to higher repair level.

It's possible to do this test either with antenna coupler from Rohde& Schwarz or RF adapter. When using RF adapter a battery eliminator together with a power box can be used.

It's very important that a fully charged battery is used otherwise there is a risk for wrong test results.

Antenna Coupler

- Insert a test-SIM and a fully charged standard battery. Position the phone in the coupler according to the picture (Fig 1).

RF adapter

- Insert a test-SIM and the battery eliminator or a fully charged standard battery. Assemble the RF adapter according to Fig 2 and 2.1. Connect the RF cable between the Test set and the antenna adapter.

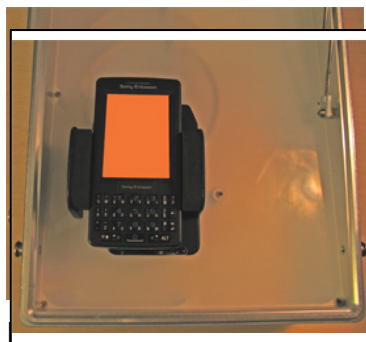


Fig. 2



Fig. 2.1

1. Start the instrument, and run the correct script for M600i, depending how the measurement will be performed, with coupler or with RF-holder (Hard line).
2. Follow the instructions on the Test instrument during the test



### 3.2.2 SERP GNG

**NOTE!** For complete and detailed user instructions see the SERP Users Manual that gets placed on the Desktop after SERP is installed.

1. On a PC with SERP installed, start the SERP program by double clicking on the "**RepairManager.exe**" icon on the desktop.
2. In the SERP window, click on "**Settings**" and verify that the test instrument and the GPIB address correspond. Also, verify that the "**cable**" (or the **coupler**) and "**signaling**" settings are selected under the "**Coupler**" and "**Mode**" windows respectively. Click on "**Apply**" and then the "**OK**" button.
3. In the SERP window, enter (or scan) the IMEI number of the mobile to be tested into the "**Enter IMEI**" box and click on the "**Enter**" button. The appropriate phone model will be displayed.
4. In the SERP window, ✓check the "**Final GoNogo Test**" box only. Click on the "**Start Test**" button and follow the instructions. (Power on the phone when the "**Call Connection**" dialog box appears.)

### 3.3 Calibration

**NOTE!** A Test Program must be loaded in the handset before performing the calibration routine. After calibration the handsets must be re-customized with signalling SW.

#### 3.3.1 Flashing the Test Program (ITP) into the Mobile

**NOTE!** Flashing instructions may vary depending on the interface used.

Flash the "W950 Test Program" software into the mobile by doing the following:

1. Attach a fully charged battery to the mobile.
2. Open the EMMA III application and log in.
3. Ensure the mobile is powered off.
4. While holding the "C" button connect the mobile to the USB Flash cable. (Once the USB symbol appears in the lower left corner of the EMMA III window you may release the "C" button.)
5. Select the "W950 ITP" protocol and follow the on screen instructions.

**NOTE!** Under most circumstances the display on the mobile will be blank when the Test Program is installed.



### 3.3.2 Calibration Instructions

**NOTE!** For complete and detailed user instructions see the SERP Users Manual that gets placed on the Desktop after SERP is installed.

### 3.3.3 Updating the Commercial Software into the Mobile after Calibration

To be able to use the handset after calibration requires going through the Customization process which reloads the appropriate signalling code for the desired operator. Refer to the W950 Build Swap. Swap Customization Instruction document for further details on the Customization process.

## 3.4 Service Tests

Start up the phone.

**NOTE!** Remove SIM-card before testing.

Enter the sequence  $\uparrow * \downarrow \downarrow * \downarrow *$  by means of the Jog Dial ( $\downarrow \uparrow$ ) and by pressing (\*) on the keyboard

### 3.4.1 Main Display Test

To verify the display:

1. Select "Display" from the "Service Tests" menu.
2. The display is showing two different test patterns when pressing the jog-dial button. Make sure that there are no dots missing and that the colours and contrast is OK.
3. Press the " $\hookleftarrow$ " key on the left side to go back to the service tests menu.

### 3.4.2 Touch screen Test

To verify the functionality of the touch screen.

1. Select "Touch screen" from the "Service Tests" menu.
2. Draw with the supplied pen a simple picture on the screen and check that the picture corresponds to your movements of the pen.
3. Press the " $\hookleftarrow$ " key on the left side to go back to the service tests menu.

### 3.4.3 Illumination Test

To verify that the backlight of the display is OK:



1. Select "illumination" from the "Service Tests" menu.
2. Check that the backlight in the display toggles between normal and bright and that the backlight of the keyboard toggles between on and off.
3. Press the "↵" key on the left side to go back to the service tests menu.

#### **3.4.4 LED Test**

To verify that the Top LED is working:

1. Select "LED's" from the "Service tests" menu.
2. Check that the red led in the IrDA-window toggles between on and off.
3. Press the "↵" key on the left side to go back to the service tests menu.



### 3.4.5 Keyboard Test

To verify that all the keys are working:

1. Select "Keyboard" from the "Service Tests".
2. Press all keys on the keyboard including "left and right function" of the buttons having this feature. Press also the buttons at the left, right and top of the phone. The up/down and the push function of the jog-dial button shall also be tested.
3. Press the "↵" key twice on the left side to go back to the service tests menu.

### 3.4.6 Vibrator Test

To verify the vibrator function:

1. Select "Vibrator" from the "Service Tests" menu.
2. Press "On" on the display to activate the vibrator. Press "Off" on the display to deactivate the vibrator.
3. Press the "↵" key on the left side to go back to the service tests menu.

### 3.4.7 Speaker and Earphone Test

**Warning! Do NOT hold the phone to your ear while performing this test.**

To verify the Speaker and Earphone function:

1. Select "Speakers" from the "Service Tests" menu.
2. Adjust the volume and make sure that the Speaker is working properly.
3. Press the "Front" on the display to select the earphone.
4. Adjust the volume and make sure that the Earphone is working properly.
5. Press the "↵" key on the left side to go back to the service tests menu.

### 3.4.8 Microphone Test

This test is intended to test the microphone. Therefore, the earphone should be tested before this test is entered.

1. Select "Microphone" from the "Service Tests" menu.
2. The phone will start to record and after that the sound is played in the speaker. Make sure that the record sounds have a loud and clear sound.
3. Press the "↵" key on the left side to go back to the service tests menu.



### 3.4.9 FM radio

This test will check if the inbuilt FM radio is working.  
Hands free equipment is used in this test.

1. Select "FM radio" from the "Service Tests" menu.
2. Connect the hands free equipment to the system connector and tune in a well-known FM-Radio channel. Verify that it's possible to switch between different radio channels and that the sound is clear.
3. Press the "↵" key on the left side to go back to the service tests menu

### 3.4.10 Media Memory

A 4 GB flash Media memory for user file storage, primarily intended for music files. This memory behaves like a normal disk drive. It can be accessed as a USB mass storage device from a PC, allowing the fast transfer of files.

The media memory is not affected by a master reset.

The media memory can be formatted, select *Tools>File manager>more>device>format media memory>format*

NOTE:all information on the Media Memory will be deleted during formatting.

### 3.4.11 On The Air Call To Mobile

To verify the function of the speaker, microphone, polyphonic ring signal and volumes button.

1. Insert an operator SIM card and start the phone.
2. Set up a call from another phone to the mobile phone.
3. Answer the phone call.
4. Check that the polyphonic ring signal is working and that the backlight switches on OK.
5. Also check that the quality of the sound both in the mobile phone and the other phone are OK.
6. Press the volume key up and down and check that the volume in the phone is altered.
7. End the call.
8. Check that the ending procedure is OK and that the speech time is displayed.





### **3.4.12 Infrared Test**

To verify that the Infrared communication is working:

1. Insert a SIM card, connect a battery and start the unit.
2. Activate the function by entering Connectivity/Infrared port and select "10 minutes".
3. Set up an infrared link between an IR device and the phone. The IR-module is placed on the right side of the phone. If a link can be established, the module is considered working.

### **3.4.13 Bluetooth Test**

To verify that the Bluetooth communication is working:

1. Insert a SIM card, connect a battery and start the unit.
2. Activate the Bluetooth function by entering Connectivity/Bluetooth and turn it on.
3. Set up a link between the phone and another Bluetooth compatible device. If a connection can be established the Bluetooth module is considered working.



### **3.4.14 System Connector Test**

Hands free equipment and a charger are used in this test, to check the functionality of the System Connector.

1. Insert a SIM card, connect a battery and start the unit.
2. Connect the Hands free equipment to the system connector and set up a call and listen if you can speak/hear in the hands free set.
3. Connect the charger to the system connector and see if the phone starts to charge and if the charging is indicated in the display.



## 4 Revision History

Rev.	Date	Changes / Comments
A	2006-09-21	First release