



Test Instruction - Electrical

Applicable for P990i

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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 the 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. Press the sequence **➡*⬅⬅*⬅*** with the navigate-button on the flip-keyboard. If flip-keyboard is removed enter the sequence **⬆*⬇⬇*⬇*** by means of the Jog Dial (**⬇⬆**) and by pressing (*****) on the display.
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. Connect the RF cable between the Test set and the antenna adapter.



Fig. 1



Fig. 2



1. Start the instrument, and run the correct script for P990i, 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 "**CallConnection**" 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 "P990 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 EMMA III window you may release the "C" button.)
5. Select the "P990 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.

This reloads the appropriate signaling code for the desired operator. Refer to the P990 Build Swap.

Swap Customization Instruction document for further details on the Customization process.

3.4 Service Tests

Power up the phone.

NOTE! Remove the SIM-card before testing.

Enter the Service Tests menu by pressing the sequence $\rightarrow * \leftarrow \leftarrow * \leftarrow *$ with the navigate-button on the flip-keyboard. If flip-keyboard is removed enter the sequence $\uparrow * \downarrow \downarrow * \downarrow *$ by means of the Jog Dial ($\downarrow \uparrow$) and by pressing (*) on the display. Select "Service Tests".

3.4.1 Main Display Test

To verify the display:

1. Select "Main display" from the "Service Tests" menu.
2. The display toggles between four different test patterns.
Make sure that there are no dots missing and that the colours and contrast is OK.
3. Press the " \hookleftarrow " key to go back to the service tests menu.

3.4.2 Camera Test

To verify the camera functionality:

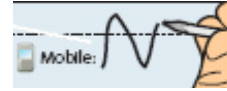
1. Select "Camera" from the "Service Tests" menu.
2. Open the camera shutter on the backside of the phone.
3. The camera function will now starts and are visible in the display.
4. Camera test starts with video camera and you can switch to check the 2 M pixel camera by pressing "rear". Make sure that the contrast and light is OK.
5. To check the "Flash" press "flash" in the camera test.
6. Close the camera shutter to go back to the service tests menu.



3.4.3 Touch screen

To verify the touch screen functionality:

1. Select "Touch screen" from the "Service Tests" menu.



2. Use the stylus pen do hand writing check
3. Press the "↵" key to go back to the service tests menu.

3.4.4 Illumination Test

To verify that the backlight and the Top LED are OK:

1. Select "illumination" from the "Service Tests" menu.
2. Check that the backlight on the LCD and the keyboard is toggle between on and off.
3. Check also
4. Press the "Ok" key to go back to the service tests menu.

3.4.5 LED's

1. Select "Led's" from the "Service Tests" menu
2. Check that the led upper right corner is switching between red and green.



3.4.6 Keyboard Test

To verify that all the keys are working:

1. Select "Keyboard" from the "Service Tests".
2. Press all keys on the keypads, the camera and the flash led key on the right side and the volume keys on the left side. If they are ok a text feedback is displayed showing the information which key was pressed. All keys should be tested.
3. If you stop pressing keys the phone will return to the service test menu.

3.4.7 Vibrator Test

To verify the vibrator function:

1. Select "Vibrator" from the "Service Tests" menu.
2. Press any key and the vibrator will vibrate 3 times.
3. Press the "Ok" key to go back to the service tests menu.

3.4.8 Speaker Test

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

To verify the Speaker function:

1. Select "Speaker" from the "Service Tests" menu.
2. Adjust the volume and make sure that the Speaker is working properly.
3. Switch between "front" and "rear" to test both back speaker and earphone.
4. Press the "Ok" key to go back to the service tests menu.

3.4.9 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 "Ok" key to go back to the service tests menu.



3.4.10 FM Radio Test

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.

3.4.11 Memory Stick Test

This test is to verify if the communication to the memory stick is working.

1. Insert a memory stick in to the memory stick holder.
2. Select "Memory Stick" from the "Service tests" menu.
3. Make sure that the phone will detect the memory stick.
4. Remove the memory stick from the holder.
5. Press the "Ok" key to go back to the service tests menu.

4 Manual Test

4.1.1 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.

4.1.2 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.

4.1.3 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.






4.2 WLAN test


Select **Tools > Control panel > Connections > WLAN** to activate your phone for wireless LAN.

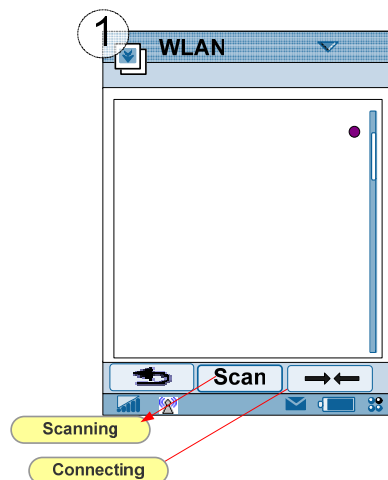
Finding a network

Select **Scan** to find available wireless LAN networks.

The networks found are listed in alphabetical order, with icons indicating network quality and type:

-  Good connection quality
-  Medium connection quality
-  Low connection quality
-  The network is configured and the phone has an account for it
-  The network is a secured network, requiring encryption keys for access

To use a specific network, select it and tap .

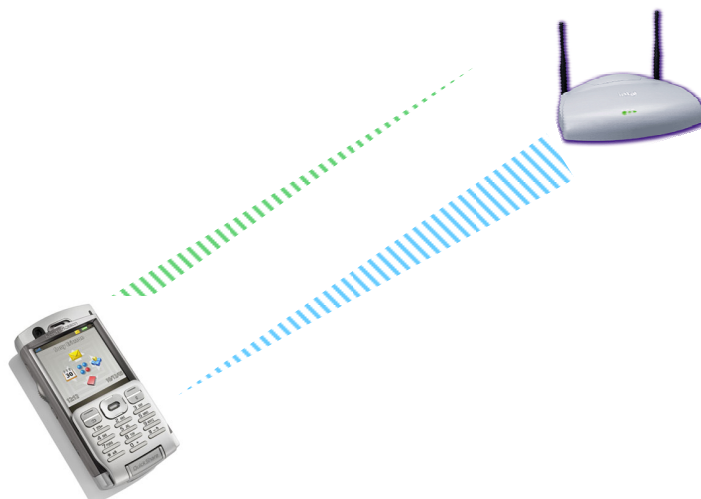


The WLAN menu, mentioned above, is also where you go to find the MAC address of the phone.

Flight mode

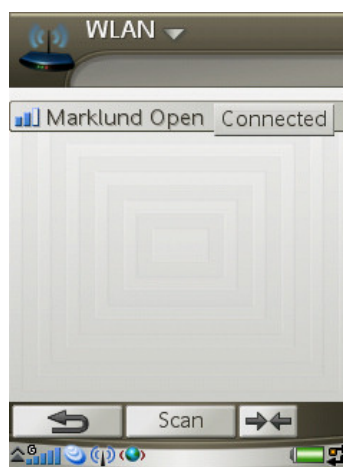
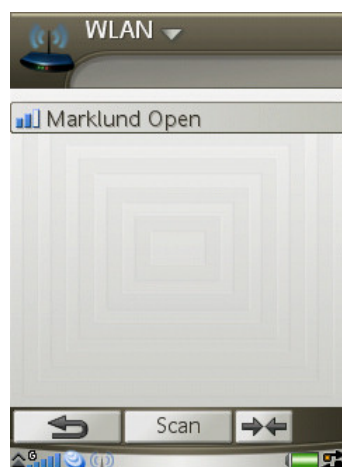
In Flight mode, the phone's radio functions and FM radio are switched off. You can still use the organizer applications, and applications that can use a wireless LAN connection.

Test to an unprotected Network



Scan

Connect



NOTE! If you are successful in scan and connect, the P990 is considered functional.

Checking if P990 MAC address is registered in Accesspoint (optional)

- Go to the WLAN menu in the P990, choose the “Mac-address” and read the Mac address
- Follow instructions and connect to Wireless network.
- Goto Laptop and open admin page.
- Navigate to Status and Wireless page. (Wireless router menu dependend)
- Update page and check if the P990 MAC address is registered.

4.2.1 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.

5 Revision History

Rev.	Date	Changes / Comments
A	2006-07-20	First release