User's Manual

Model 733015
VC200 Mobile Phone Tester
Signaling Tester Mode
Setup Guide

YOKOGAWA
Yokogawa Electric Corporation

IM 733015-02E
1st Edition

Contents

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1. Introduction

Thank you for purchasing the VC200 Mobile Phone Tester.

This guide describes in order the basic operations of the VC200 in auto test mode and manual test mode of signaling tester mode. Use this guide to familiarize yourself with the basic operations of performing the connection tests on the W-CDMA/GSM mobile phones after the installation of the VC200.

For more details, see the accompanying user's manual.

2. Preparation

Items to Be Prepared

- VC200
- Power cord (standard accessory)
- USB mouse (standard accessory)
- W-CDMA/GSM mobile phone
- TEST-USIM card*1
- Coaxial cable to connect the mobile phone*2

<Note>

***1 Dedicated USIM cards for testing (733065-D01 and 733065-E02) are sold separately from YOKOGAWA.**

***2 Select the appropriate cable and conversion connector according to the RF connection of the mobile phone under test.** If the mobile phone under test does not have an RF connector, use the antenna coupler of the shield box (733061 VC-SHIELD sold separately) or a similar apparatus and perform the test through air coupling.

3. Starting the VC200

1. Connect the power cord.
2. Connect the USB mouse to the USB connector at the lower right of the front panel.
3. Turn ON the power switch at the lower left on the front panel.
4. The startup screen for the OS appears. After a moment, the main window of the tester appears.

<Note>

- **Do not remove the power plug while the VC200 is in operation (while the green POWER LED on the front panel is illuminated).**
- **When turning the power OFF, be sure to press the power switch at the lower left on the front panel.**

4. Connecting to the Mobile Phone

1. Turn OFF the mobile phone under test.
2. Insert YOKOGAWA's TEST-USIM into the mobile phone.
3. Connect the RF connector of the mobile phone to the RF connector of the VC200 with a coaxial cable. Use a conversion connector as necessary.
   If the mobile phone under test does not have an RF connector, use the antenna coupler of the shield box (733061 VC-SHIELD sold separately) or a similar apparatus and perform the test through air coupling.

<Note>

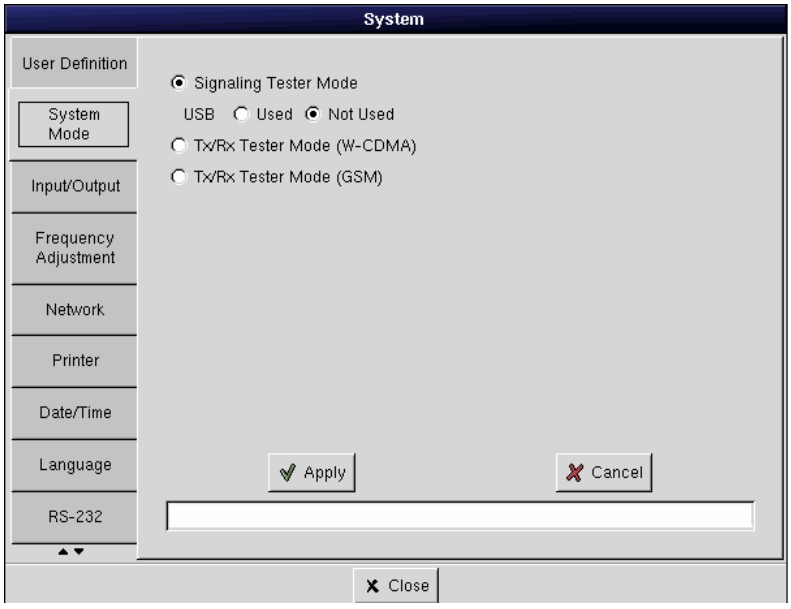
Screw the RF IN/OUT connector all the way. Bad connection can lead to abnormal power measurements and unstable operation.

When connecting the mobile phone, check its settings. The test may not be performed correctly if the mode setting (DUAL, WCDMA, or GSM) or the RF connector is not appropriate.

5. Switching the Tester Mode

If the test mode is set to Tx/Rx tester mode, switch to signaling tester mode by carrying out the following procedure.

1. Click **System** at the top section of the screen.
2. On the System Mode page, select **Signaling Tester Mode**. Set USB to **Not Used**.
3. Click **Apply**.
4. Click **Close** to finish.



6. Selecting the Model Parameter File

You must select a model parameter file in the VC200 signaling tester mode.

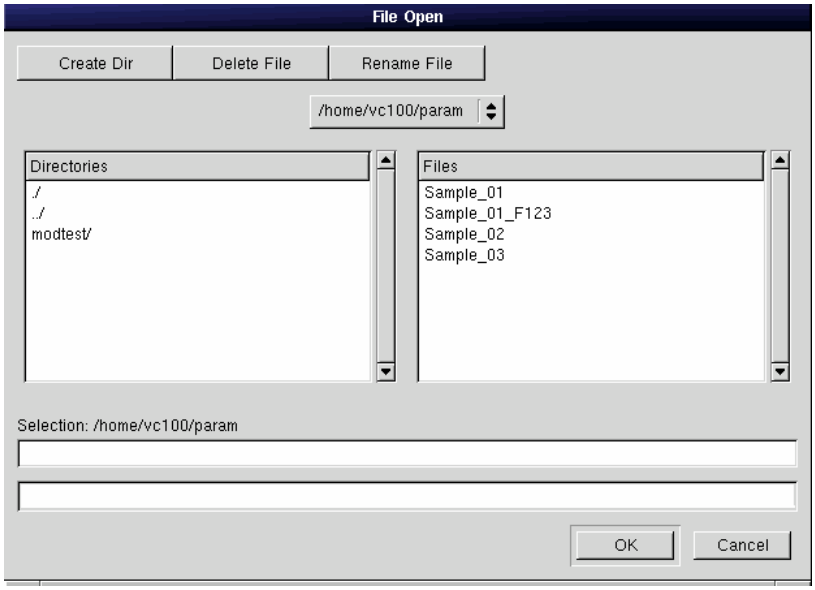
Various types of information can be specified in the model parameter file including the physical parameter settings of the VC200, RF correction value according to the measurement environment, test items, criteria for judging pass/fail of the radio characteristics test, and W-CDMA protocol data. You can specify whether to test only WCDMA, GSM, or both.

The contents of the model parameter file can be edited from a PC connected to the VC200 via the network. The editing procedure is explained in chapter 10.

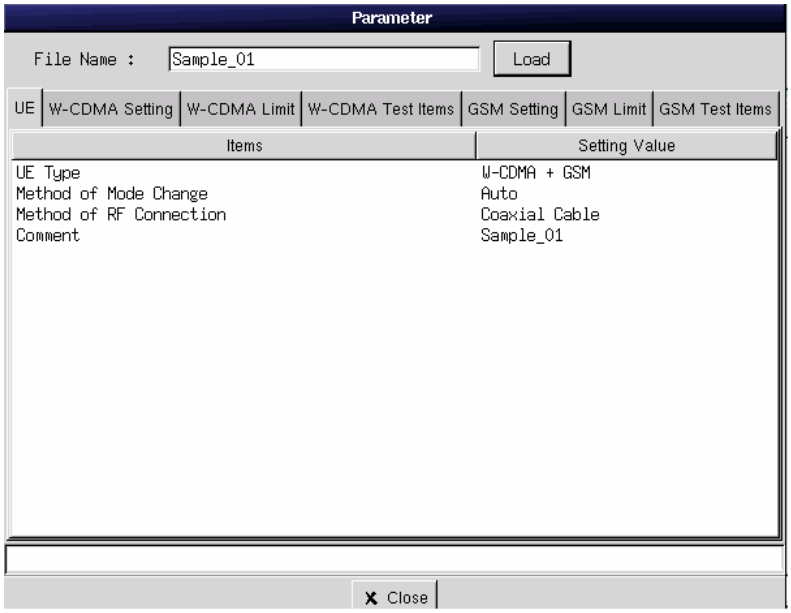
When the VC200 is shipped from the factory, a file named “Sample_01” containing typical parameter settings for dual mode is stored. This section uses this file for the explanation.

1. Click **Model**.
2. Click **Load** to display a list of model parameter files stored in the VC200 under Files on the right side of the screen. By factory default, several model parameter files exist such as “Sample_01.”
3. From the list, select “Sample_01” with the mouse.
4. Click **OK** to finish the selection and setting.

(You can also finish the settings by double-clicking the file name in step 3.)



5. At this point, the screen contains seven tab pages such as UE and W-CDMA Setting. You can click each tab to view the settings that are specified in the selected model parameter file.



6. Click **Close** to return to the main screen.

<Regarding the model parameter file "Sample_01">

This parameter file is configured so that all connection functions and all radio characteristics tests are performed in W-CDMA and GSM modes (dual mode). The RF power correction value is set to 3 dB, which is approximately equal to the attenuation of the dedicated cable, 733071. The criteria for judging pass/fail of the radio characteristics test are set to values that pretty much comply with the 3GPP test specifications, but a portion of the values is modified.

<Note>

The operation of the W-CDMA protocol data used in the model parameter file "Sample_01" has been checked with typical UMTS terminals that have been shipped by October 2004. In the unlikely event that a call cannot be set up, contact your nearest YOKOGAWA dealer.

The settings in the model parameter file are mainly used for the auto test, but they are also used for the manual test. Therefore, a model parameter file must also be selected in advance for the manual test.

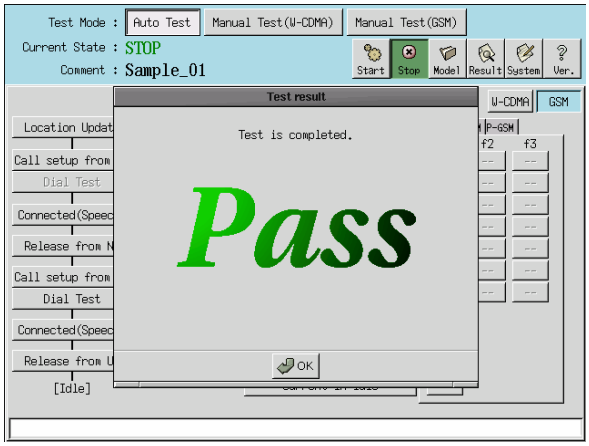
7. Executing Auto Test Mode

1. Click the **Auto Test** button at the top section of the screen to select auto test mode.
2. Turn OFF the mobile phone under test.
3. Press the **START** button on the VC200 front panel or click **Start** on the screen.
4. Turn ON the mobile phone under test. Registration is performed.
5. Then, all tests are executed automatically. If a dialog box appears on the VC200, operate the mobile phone according to the displayed instructions. The results of each test are displayed as Pass (green) or Fail (red).

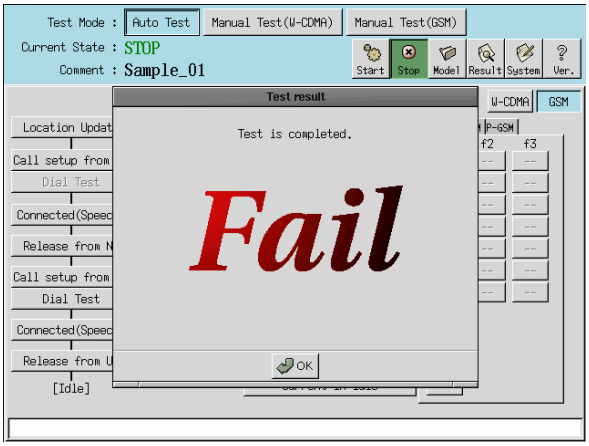
   Note: If the call setup fails and the test can no longer continue, the test is aborted at that point.

6. The speech test passes if the voice spoken into the mobile phone is returned slightly later. If the test passes, press the **START** button or click **YES** in the dialog box.
7. The mode switches in order from W-CDMA to GSM, and the tests are executed consecutively (for tests in dual mode).
8. When all tests are completed, a dialog box showing the overall result opens. When all test items pass, the dialog box displays Pass. If any of the test items failed, the dialog box displays Fail.

Pass

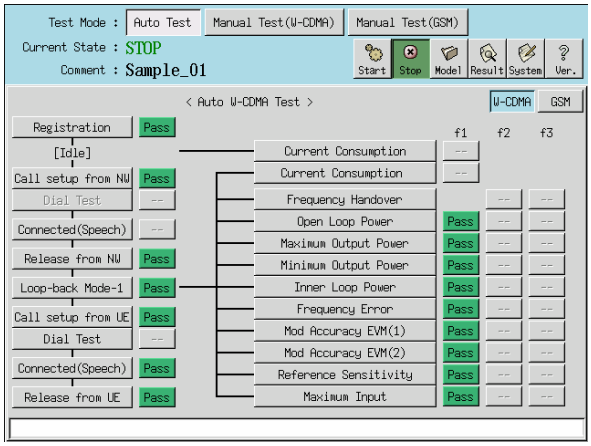


Fail

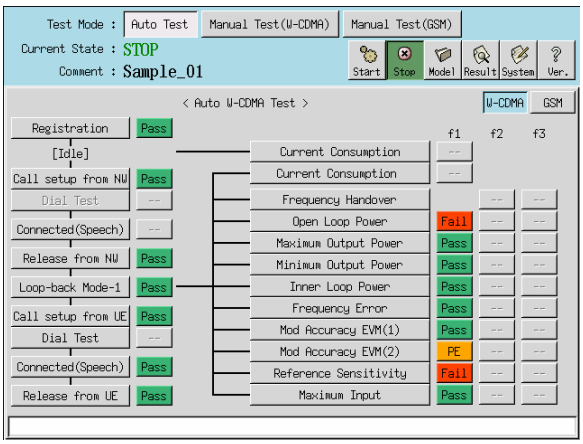


9. If “Fail” is displayed, “Fail” is also displayed in the corresponding test item. For items that have “PE” displayed, the test was passed, but the power used in the test was inappropriate.

When all test results are Pass

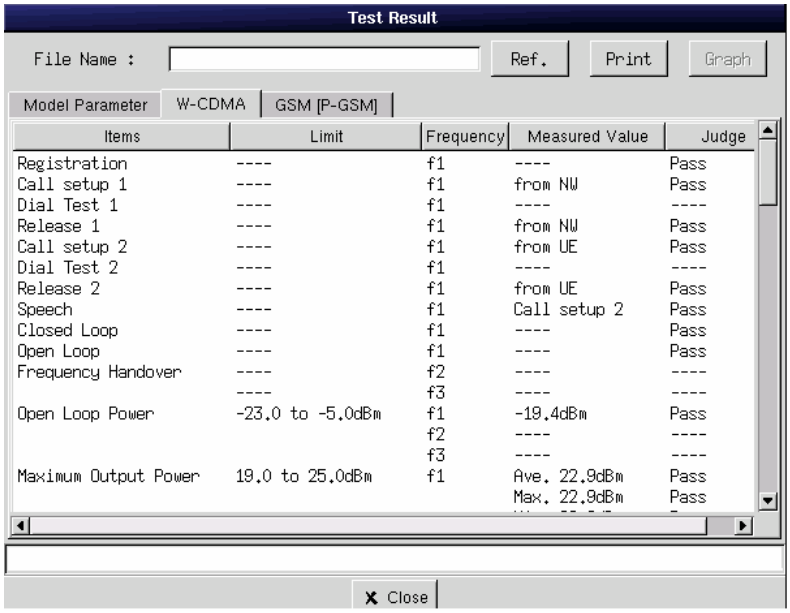


When some test results are Fail or PE



10. After the test is complete, you can view the details of the test results by clicking **Result**. View the results of W-CDMA and GSM by selecting the appropriate tab.
    The average, maximum, and minimum values are displayed for the measurement results of the radio characteristics. The number of measurements can be specified in the model parameter file. It is set to 1 in “Sample_01.”
    Because all of the results cannot be displayed on a single screen, scroll the screen by dragging the

scroll bar at the right of the screen or by clicking the up/down arrow.



11. Click **Close** to return to the main screen.

<Note>

Be sure to check that the mobile phone is turned OFF before starting the VC200.

If you turn OFF the mobile phone while the test is in progress on the VC200, the registration may not be carried out correctly the next time the mobile phone is turned ON.

If you happen to start the VC200 when the mobile phone is not completely turned OFF, stop the VC200, wait for the mobile phone to completely turn OFF, and then restart the VC200. Then, turn the mobile phone ON.

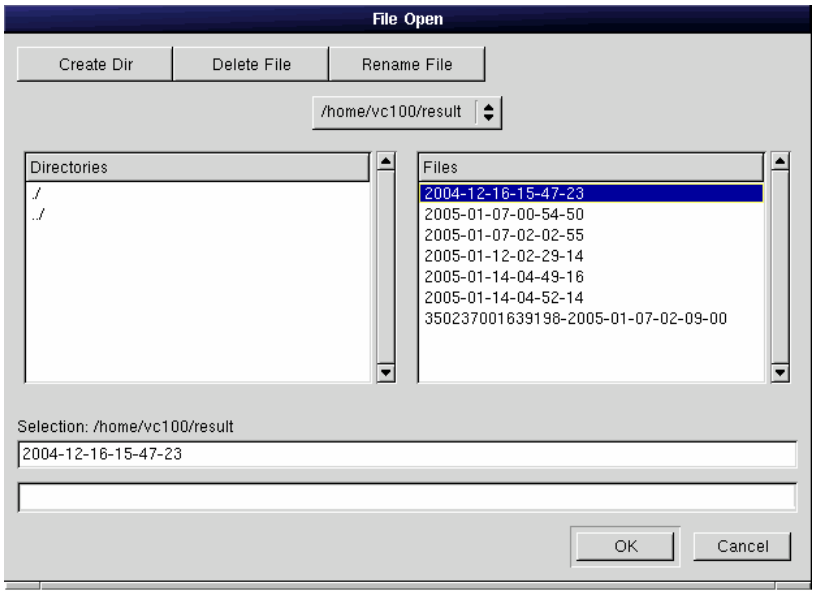
8. Result File of Auto Test Mode

Each time a test is executed in auto test mode, the result is saved to the hard disk in a log file. You can view the result file by carrying out the procedure below.

1. Click **Result**.
2. Click **Ref**.
3. A list of result files that are saved is shown under Files.

   The file name is composed of “the IMEI (International Mobile Equipment Identity) of the mobile phone under test + the date/time when the test was completed.”

   To show the files that do not fit in the window, drag the scroll bar at the right or click the arrows to scroll. (If the IMEI cannot be acquired, only the date/time is used.)
4. Select the desired file.



5. Click **OK** to display the contents of the file.
   (You can also double-click the file in step 4.)
6. Click **Close** to finish.

9. Executing Manual Test Mode

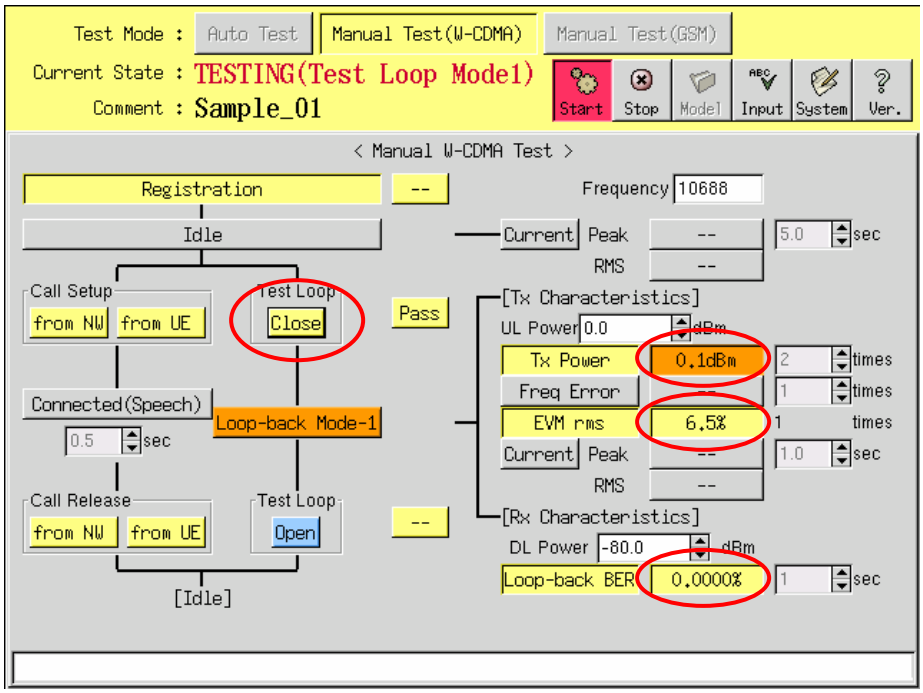
In manual test mode, you can carry out arbitrary test items by clicking on the screen.

This chapter explains an example in which the following tests of the W-CDMA function are carried out in order.

Registration, (idle), call setup from NW, (call setup), call release from NW, (idle), test loop close, radio characteristics test (modulation accuracy and BER), test loop open, (idle), and end of test

1. Click the **Manual Test (W-CDMA)** button at the top section of the screen to select manual test mode.
2. For each radio characteristics test item, you can select whether to execute the measurement in advance. Each time an item button is clicked, the text background changes. Click the desired test item so that the text background is cream colored.
   In this example, Tx Power and EVM rms of the Tx characteristics and Loop-back BER of the Rx characteristics are selected.
3. Turn OFF the mobile phone under test.
4. Press the **START** button on the VC200 front panel or click **Start** on the screen.
5. Turn ON the mobile phone under test. Registration is performed. The mobile phone under test enters idle mode and waits for the next operation.
6. Click the **from NW** button under Call Setup. A call setup sequence starts. When the mobile phone receives the call, it rings. Press the talk button on the mobile phone. The call is established, and the connected state is held until the next operation is carried out.
7. Click the **from NW** button under Call Release. A call release sequence is started. If the call is released normally, the mobile phone returns to idle mode and waits for the next operation.

8. Click the **Close** button under Test Loop. A test loop sequence starts. When the test loop is established correctly, radio characteristics measurement starts. In this example, the measurement of Tx Power, EVM rms, and Loop-back BER is specified. Thus, these three radio characteristics are measured repetitively.



9. Click the arrow button by the UL Power box to change the value. This box enables you to set the uplink power of the mobile phone under test. The power on the mobile phone is set to the specified power value, and the measured results of Tx Power change accordingly.
10. Click the **Test Loop Open** button. The test loop is released, and the mobile phone returns to idle mode.
11. Press the **STOP** button on the VC200 front panel or click **Stop** on the screen to finish the test.

10. Editing a Model Parameter File

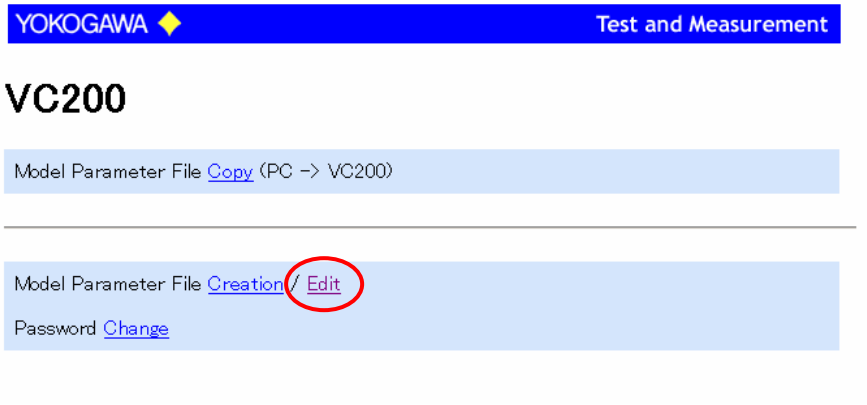
You can edit the model parameter file from a PC connected to the VC200 via the network and save the file in the VC200. (For details on the network connection, see chapter 11, “Network Connection.”)

10.1 Accessing the VC200 from a PC

The VC200 has a WEB server function that allows the model parameter file to be edited from a WEB page on the PC connected to the VC200 via the network. You can easily access the VC200 by starting a WEB browser on your PC and entering the IP address of the VC200 for the URL address. The VC200 can be configured intuitively through the graphical user interface of the WEB page.

1. Start the WEB browser on your PC.

2. Enter the IP address of the target VC200 in the address box of the browser, and press the Enter key on your PC. (You can check the IP address of the VC200 by clicking **System** > **Network**.)
3. When an access is made to the VC200, the top page of the model parameter settings is displayed.



10.2 Editing the File

1. Click Edit to open a dialog box for entering the user name and password. Enter the values below.

   User name: vc100

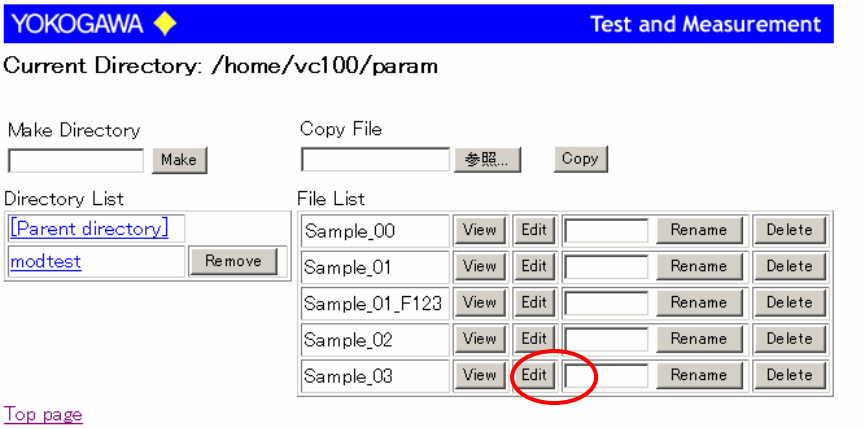
   Password: master

   Click **OK** to display the file list screen.

   <Note>

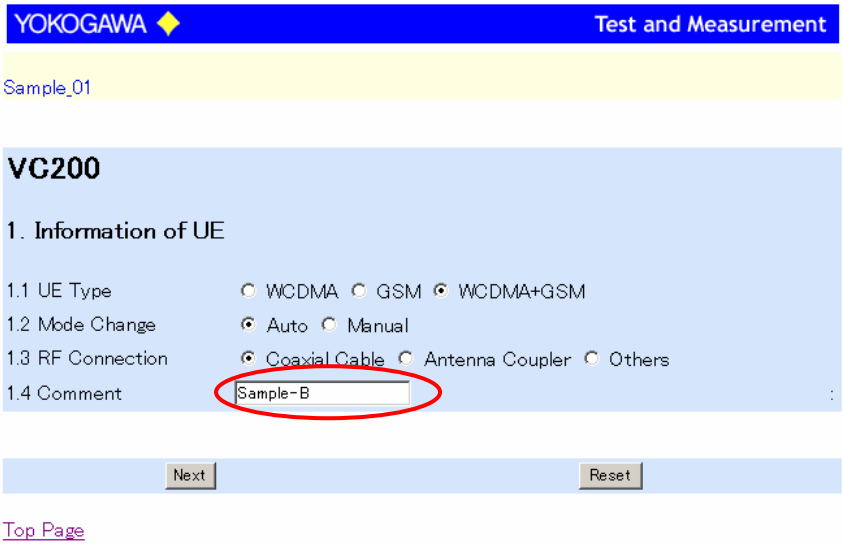
   The user name is "vc100" (lowercase) not "vc200" to maintain compatibility with the VC100. The default password is as shown above. You can change the password by clicking Password Change on the top page as necessary. If you change the password, be sure not to forget it.

2. A list of files is displayed on the right side. In this example, click **Edit** for the file "Sample_01" that is saved by factory default.



3. On the Information of UE screen, you can set UE Type, Mode Change, RF Connection, and Comment. The comment is displayed at the top section of the signaling test mode main screen on the VC200.

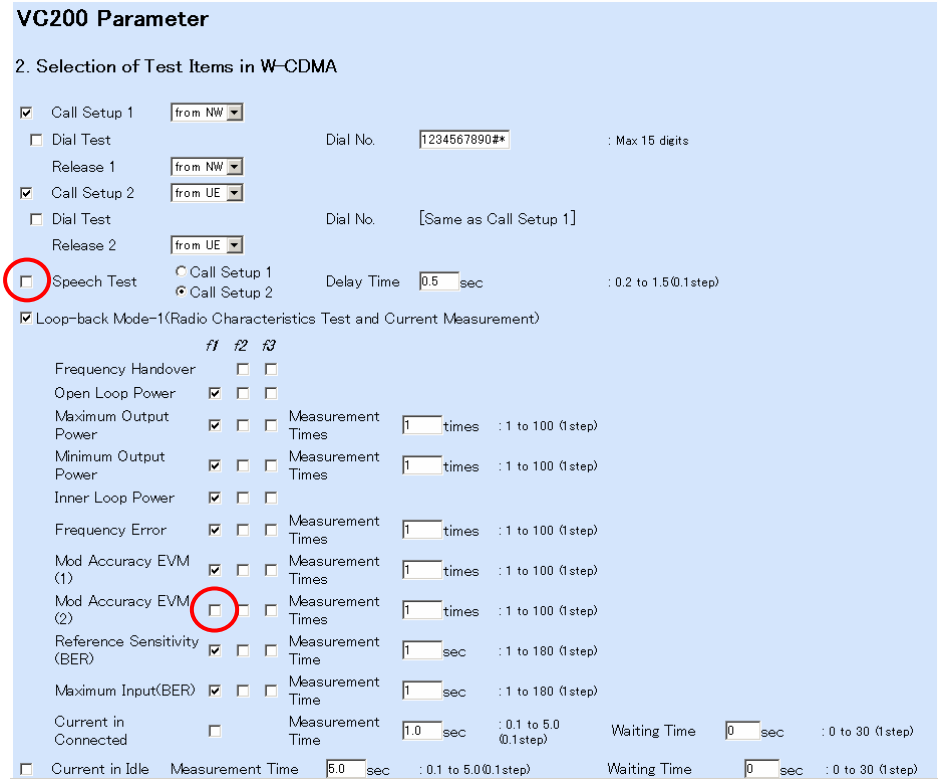
   In this example, change the comment to “Sample-B” and click **Next**.



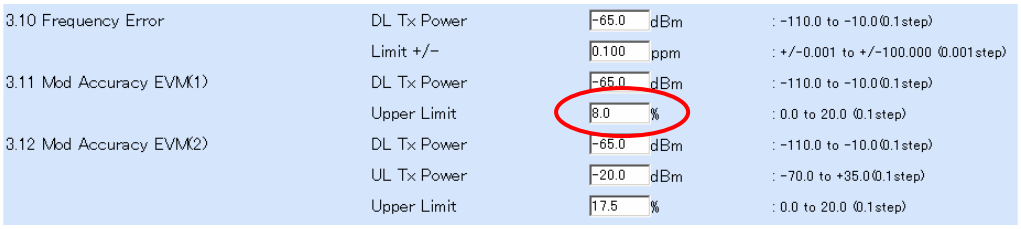
4. Edit the parameters.

   In this example, **Speech Test** and **Mod Accuracy EVM (2)** are excluded from the test. The upper limit of Mod Accuracy EVM (1) is changed from 17.5% to 8.0%.

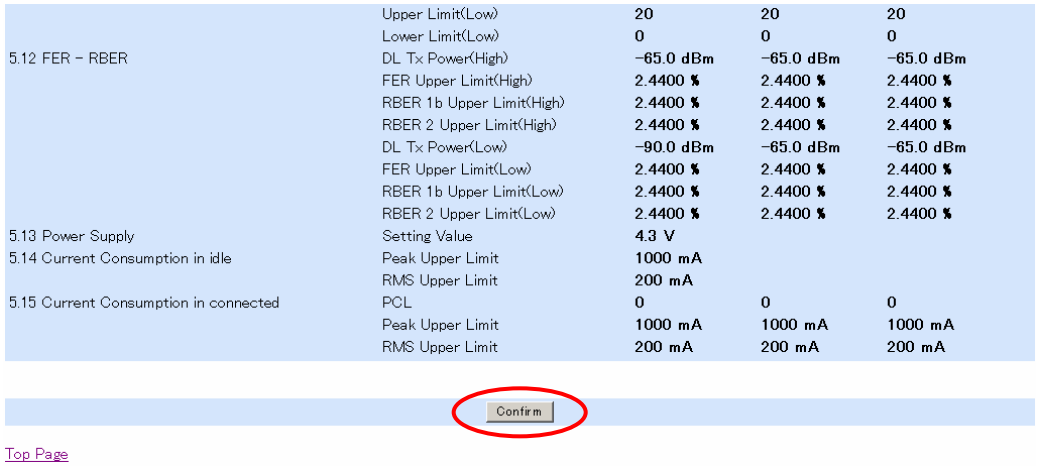
5. The parameters are divided into “2. Selection of Test Items in W-CDMA,” is used to select the items to be executed and “3. W-CDMA,” which is used to set the parameter values. Clear the **Speech Test** and **Mod Accuracy EVM (2)** check boxes from the test items to exclude them.



6. Scroll down and change the upper limit of **Mod Accuracy EVM (1)** from 17.5% to 8.0%.



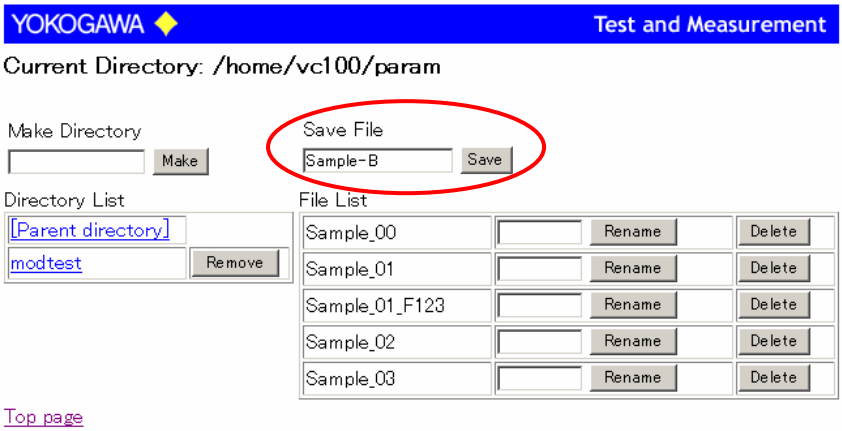
7. Click **Next** to move to the page for setting GSM parameters. The parameters are divided into “4. Selection of Test Items in GSM” and “5. GSM” used to set the parameter values. Since we are not changing the parameters on this page, click **Next**.
8. A confirmation page appears and a list of parameters is shown. After confirming the parameters, click **Confirm** at the top or bottom of the page to move to the file save page.



9. Enter a new file name in the Save File box. In this example, enter the file name “Sample-B” and click **Save** on the right. This completes the file editing and saving of the new file.

<Note>

If a file with the same name exists, it will be overwritten.

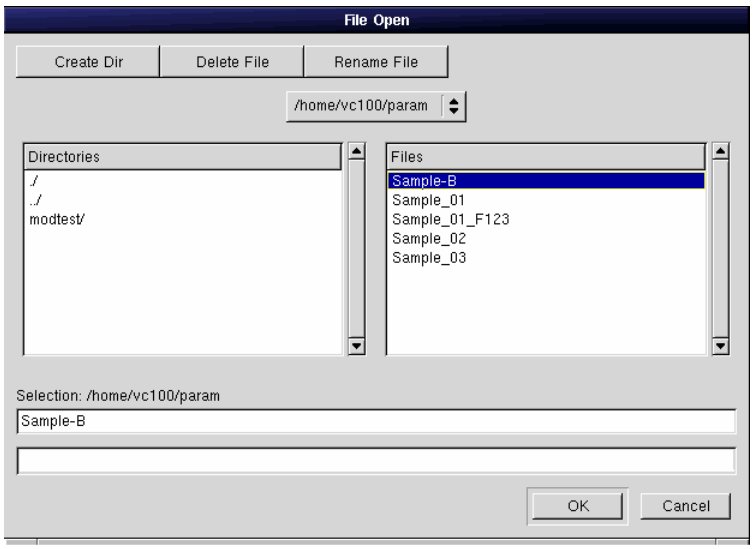


10.3 Loading and Checking the New Model Parameter File

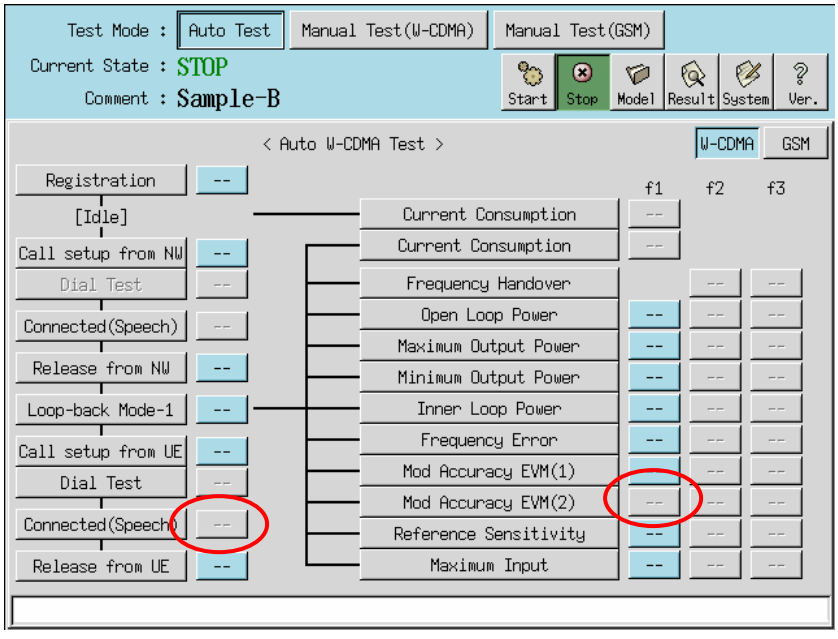
Carry out the procedure below on the VC200 to load to the target VC200 connected to the network the model parameter file that you created/edited with the operations up to the previous page.

1. Click **Model**.
2. Click **Load** to display a list of model parameter files under Files on the right side of the screen.
3. The new parameter file “Sample-B” is displayed in the list. Select it.
4. Click **OK** to finish the selection and setting.

(You can also finish the settings by double-clicking the file name in step 3.)



5. On the screen that appears, you can view the conditions specified in the model parameter file “Sample-B” by clicking the seven tabs.
   Check that the settings that you edited earlier are applied.
6. Click **Close** to return to the main screen.
7. On the test sequence diagram on the main screen, check that the areas used to show Pass/Fail for Mod Accuracy EVM (2) and Connected (Speech) are dimmed and removed from the test.



11. Network Connection

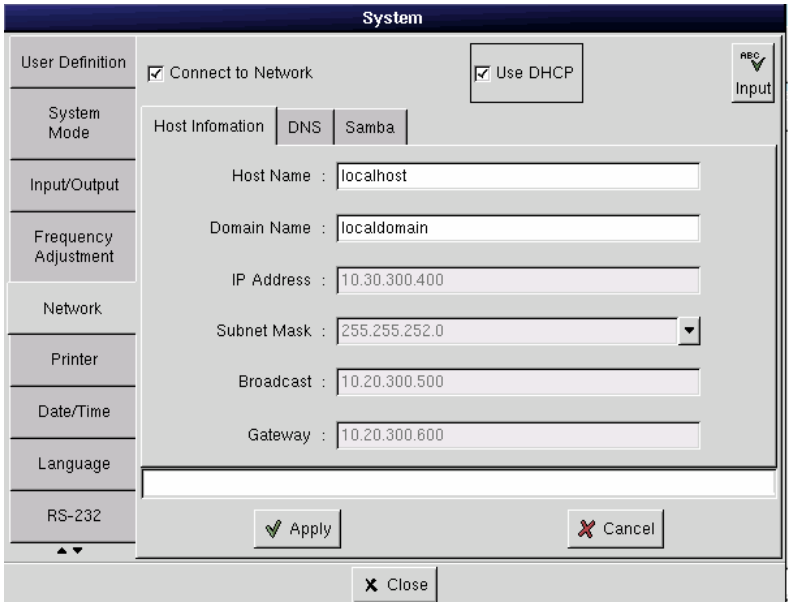
The following two methods are available in configuring the VC200 network parameters.

- Dynamic IP address: The VC200 automatically sets the IP address received from the DHCP server when it starts up.
- Fixed IP address: The user obtains a fixed IP address from the network administrator and manually sets the VC200.

Check with your network administrator to see if DHCP can be used.

11.1 When Using a Dynamic IP Address

1. Click **System** on the main screen.
2. Click the **Network** tab.
3. Select the **Connect to Network** and **Use DHCP** check boxes.
4. Click **Apply**. After a moment, an IP address (10.20.300.400 in this example) is obtained from the DHCP server and displayed in the IP Address box.
5. Click **Close** to finish.



11.2 When Using a Fixed IP Address

1. Obtain a fixed IP address that can be used on the LAN from your network administrator.
2. Click **System** on the main screen.
3. Click the **Network** tab.
4. Select the **Connect to Network** check box and clear the **Use DHCP** check box.
5. Enter the value assigned by your network administrator (11.22.333.444 in this example) in the IP Address box.

   Set other parameters as necessary by consulting your network administrator.

   You can enter settings by placing the cursor in the desired box, clicking **Input** at the upper right of the screen to display a virtual keyboard, and clicking the keys.

6. Click **Apply** followed by **Close** to finish.