

## ◀||| APPLICATION NOTE |||▶

### v.90 Modem Monitor Test Function for Sage 960B

This document briefly describes the new v.90 Modem Monitor test function for the Sage Model 960B IP Telephony Set, and how to run it.

#### Background

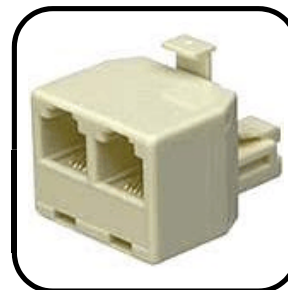
A modem call can fail for all sorts of reasons. The v.90 Modem Monitor function can help identify the exact cause. This test is specifically designed to analyze the protocols of v.90, v.91, v.92 and v.34 modems.

The v.90 Modem Monitor is a real-time, passive and listening-only modem call monitoring tool. It works by simultaneously monitoring and analyzing the signals from both modems, and displaying the relevant time-stamped information in real-time. Test access is through PCM (T1 or E1) MONITORING mode, or metallic analog MONITORING mode.

Detailed information about the v.90 Modem Monitor function can be obtained by downloading the related Sage white paper: <<http://www.sageinst.com/downloads/925/v90p.pdf>>

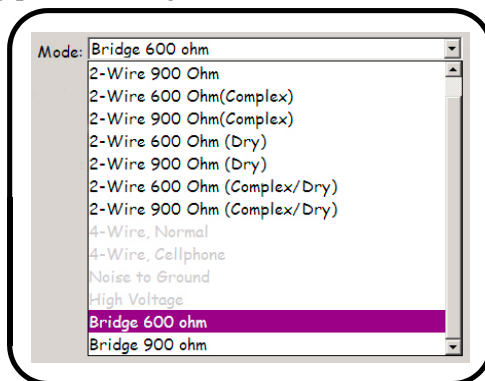
#### Procedure for Modem Monitoring at a 2-Wire Metallic Analog Point

1. Connect the desired 960B analog port to the dialing end of the circuit by using an RJ-11 jack splitter similar to the one pictured in *Figure 1*.
  - a. Connect the dialing modem to one of the two jacks on the splitter, then connect the desired 960B analog port to the other jack.



**Figure 1** — RJ-11 Splitter

2. Configure the 960B analog port for Bridge 600 ohms
  - a. Click the "Home" button located at the top of the Sage 96x Windows GUI (graphical user interface) screen



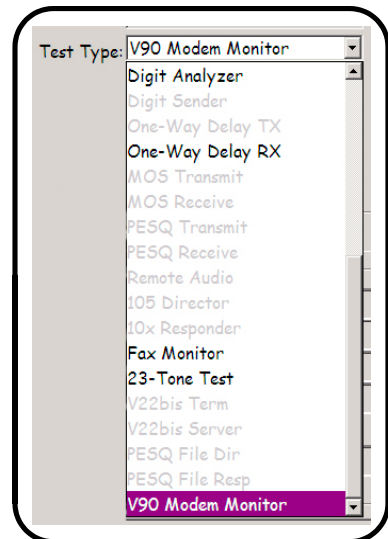
**Figure 2** – Select *Bridge 600 ohm*

- b. Double-click on the desired test access interface, then click on the "Configure" button located at the left of the display.

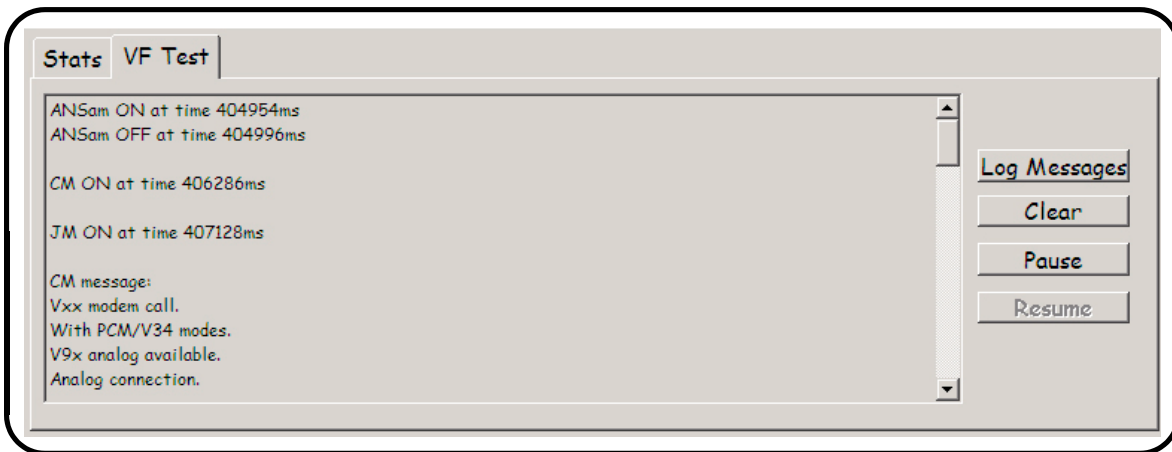
- c. In the resulting display, locate the "Mode:" window, then click on the corresponding drop down arrow, and select "Bridge 600 ohm" as illustrated in *Figure 2*, above.

3. Click the "Back" button located at the upper left of the display.
4. In the resulting "Span View" window, double-click on the channel 1 line.

5. In the resulting screen, locate the "Test Type" window. Click on its associated drop-down arrow and select "V90 Modem Monitor", as shown in *Figure 3*, at right.
6. Locate the "VF Test" tab near the bottom left of the screen, and click on it.
7. To save a log of the modem negotiation steps, click on the "Log Messages" button. The resulting log can be found in the "C:\Program Files\Sage Instruments\960\results subdirectory of your PC's hard disk. The filename will look similar to this example: "V90Mon\_Pots1\_V90 Modem Monitor\_163030.txt", where Pots1 would be replaced by the name you configured for the analog port being used. The string of digits at the end are related to the system time.
8. Start the monitor function by clicking the "Run" button located near the upper right of the screen.
9. Initiate the modem call.
10. As the call progresses, the "VF Test" tab will display analysis of the various modem negotiation steps, time stamped to the millisecond as shown in *Figure 4*, below.



**Figure 3** — Select *V90 Modem Monitor*



**Figure 4** — V.90 Modem Monitor Logging Window

A sample modem monitor log is provided on the last page of this document.

This Application Note is made available as a courtesy to our customers, in the hope it will be helpful. However, it is provided "as is" without warranty of any kind, either express or implied.

If you have any questions or comments, please contact Sage Technical Support by e-mail at <technicalsupport@sageinst.com,> or by phone at (831) 761-1000 Option 4.

## Sample Test Results

```
ANSam ON at time 404954ms
ANSam OFF at time 404996ms

CM ON at time 406286ms

JM ON at time 407128ms

CM message:
Vxx modem call.
With PCM/V34 modes.
V9x analog available.
Analog connection.

CM OFF at time 407966ms

JM message:
Vxx modem call.
With PCM/V34 modes.
V9x digital available.
Digital connection.

JM OFF at time 407988ms

INFO_0a ON at time 408114ms

INFO_0a OFF at time 408114ms

INFO_0a raw data bits 12 to 43: 0xff8447ec
No V.92 capability.

INFO_0d ON at time 408160ms

INFO_0d OFF at time 408160ms

INFO_0d raw data bits 12 to 43: 0xff851763
V.92 capable.
mu-law PCM coding

INFO_1d ON at time 409408ms

INFO_1d OFF at time 409408ms

INFO_1d raw bits 12 to 43: 0x1800985c
INFO_1d raw bits 44 to 75: 0x2e50aa54
INFO_1d raw bits 76 to 107: 0xa00b55af
INFO_1d decoded message:
At symbol rate 2400, projected max data rate = 14400
At symbol rate 2743, projected max data rate = 19201
At symbol rate 2800, projected max data rate = 19600
At symbol rate 3000, projected max data rate = 24000
At symbol rate 3200, projected max data rate = 28800
At symbol rate 3429, projected max data rate = 34290
Digital modem unable to measure frequency offset accurately

INFO_1a ON at time 409530ms

INFO_1a OFF at time 409530ms

INFO_1a raw bits 12 to 43: 0x000390b0
INFO_1a raw bits 44 to 75: 0x00ece7c0
INFO_1a decoded message:
Downstream V90 mode selected, symbol rate=8000, UINFO=78
Upstream V34 symbol rate=3200
Measured frequency offset (in mHz) by analog modem=0
```