Release Notes
v7.4.23 through v7.4.27 for 96x Multi-Channel Test Unit

This document describes a new software release (v7.4.27) for the 96x. This software supersedes Version 6.11.1 and is available now.

NEW FEATURES

1. **ITU T.38 Fax Relay Emulation** — emulates both transmitter and receiver: For both Director and Responder functions, the T38 emulator can handle all subrates of the V17 modem (7200, 9600, 12000 and 14400 bps). In addition, the Responder function adds support for V.27 and V.29.

    a. **User Control of Second "INVITE" Message** — Some products expect the responder (Called side) to transmit the second "INVITE" which triggers the switch to T38 mode, while others expect the calling end to do so.

    A user can have either our director (calling end) or responder (called end) send the second "INVITE" to switch to T38 mode and react to response messages accordingly.

    A future release will have an appropriate control in the Sage 96x GUI software. For expediency, however, Engineering has created a temporary "back door" method of allowing the user to choose the operation mode.

    The back-door control is through the jitter buffer size. If the least significant digit is set to 3 (43,53,63 ms etc), then this side (either Director or Responder) will send a second "INVITE" 2.5 seconds after the first call connection. The second "INVITE" will be sent 10 times. If no proper responses are received, we will send "BYE" and declare "TIME OUT".

2. **G.168 Test Over IP** — The G.168 test suite can now be run from IP spans toward analog or PCM access points

3. **IP Impairment Generator** — can cause lost and/or delayed packets between any two IP addresses, or all IP addresses, with selectable single or bidirectional impairment insertion. User can elect to insert the impairments in one or all of the following types of packets: UDP, TCP, ICMP, RTP, SIP, RTCP, T.38

4. **V.9x/V.34 Modem monitor** — provides a detailed report of the entire V.8 modem negotiation steps from call setup through disconnect

5. **Web Browser Task Scheduler** — Implemented in the html (browser) interface only. In the test configuration screen, allows a user to create a named test schedule, that will start the test on a specific date and time, once only or in a repeat interval of user-specified seconds, minutes, hours, days, or months. It also allows a user to specify a single destination phone number, or point to a file containing a list of destination numbers.

6. **User Control of Whether a SIP Message Is in the IMS Format** — The back-door control is through the jitter buffer size. If the least significant digit is set to 3 (41,51,61 ms etc), then the SIP message will conform to the "IMS" format. A future release will have an appropriate control in the Sage 96x GUI software.

7. **T.38 Monitor** — Monitors and reports the fax over IP protocol messages exchanged between fax machines

8. **Unframed BERT** — The 96x can now transmit and receive an unframed BERT signal. To do so,
   a. Go to the span configuration screen and click on the "Framing" drop down arrow
   b. Select "Unframed", then click on the "Save" button
   c. Go to the "Span View" and double-click on any channel
   d. Use the "Test Type" drop down arrow to select "DS0/Fractional BERT"
   e. Click on the "Test Type" Configuration button and select the desired loop code and BER pattern, then click on the Save button
   f. Click the "Run" button

   The Unframed BERT test supports transmitting either of two test patterns: 2^{15} and 2^{20}

9. **Transmit T1 Loop Back Code Under All Conditions** — The 96x will now transmit T1 NIU (network interface unit) loopback code even in the presence of a Frame Loss or No Signal Condition

10. **PCM Span Monitor** — This function accumulates and reports events in the following categories, per ITU-T Recommendation G.826: Loss of Signal, Alarm Indication Signal, Loss of Frame Alignment, Frame Error, CRC Error, BPV (code violation), Errored Block, Background Block Error, Errored Seconds, Severely Errored Seconds, Available Time, Unavailable Time, Total Elapsed Time since last counter reset. The user may log and/or print results

11. **G.729 Codec Support for SIP Calls** — The 96x now supports G.729 encode/decode for SIP calls. For the Director setup, the "Configure SIP call..." screen has a "Decoder" drop down arrow to select the type of codec. The Responder function will automatically switch to the correct codec based on the codec type specified in the incoming SIP call setup message.

    Note: The 96x supports only one normal G.729 SIP test call per test access interface.

12. **G.729 Codec Support for RTP Loader** — The RTP Loader function now supports G.729. There are no limitations of the number of simultaneous G.729 calls made by the RTP Loader function.

13. **Digit Detection in Presence of Dial Tone** — Added a filter to the digit receiver to allow digit detection in the presence of dial tone

14. **RFC2833 Emulation** — The Digit Sender function for SIP calls can now assemble and transmit the special RTP packets representing DTMF digits, per RFC2833. Click on the "RFC2833/4733" option in the "Configure Digit Sender" screen to invoke RFC2833 emulation.

15. **RTCP Monitor** — Designed per RFC 3550 (which obsoletes RFC 1889), this function gathers statistics on media connection information such as bytes sent, packets sent, lost packets, jitter, feedback and round trip delay. It provides information similar to the existing SIP Monitor function, but for RTP packets instead of SIP call setup packets.

16. **VLAN Support** — Allows a user to set the Ethernet format to VLAN. This feature also allows a user to specify the VLAN Priority, and VLAN ID Tag.

17. **Ethernet Detail Packet Counter** — The Span View screen now provides a packet counter window for each Ethernet interface, and reports:
    a. Total Tx – cumulative total transmitted packets since power on
    b. Total Rx – cumulative total received packets since power on
    c. Failed Tx – cumulative total transmitted packets that could not be delivered to the Ethernet network due to network congestion (network was too busy)
    d. Failed Rx – cumulative total incoming packets that were lost due to 96x DSP receive buffer overflow (indicates DSP was too busy)
    e. Avg Loop (microseconds) – for Sage internal use only
    f. Max Loop (microseconds) – for Sage internal use only

ENHANCEMENTS

1. **Enhanced interoperability with Lucent switching machines** — When the ISDN number type is set to "Abbreviated", the call setup message will now transmit the octet "0xa1" which means "Send Complete", although standards docs say this is optional.

2. **DNS name of Proxy Server in SIP REGISTER message** — Some SIP Proxy Servers require the REGISTER message to also contain the DNS (directory name server) name of that Proxy Server.

   A future release will have a new field in the Sage 96x GUI software. For expediency, however, Engineering has created a temporary "back door" method of allowing you to enter the DNS name of your proxy server. It requires that you provide two "keys" to open that back door:
   a. Modify the "Jitter Buffer Size" so that the right-most digit is a "2" (for example, 42, 52, 62, etc.)
   b. Enter any string of characters in the "User Name" field of the "Authentication" tab
      NOTE: If you normally enter a User Name and Password in the "Authentication" tab, then this requirement is already satisfied.

   Once the above "keys" are in place, you can enter the proxy server's DNS name in the "Local Phone#" field. Note that you must also enter the proxy server's IP address in the "Proxy Server" field of the "Configure SIP Call" dialogue box.

3. **More robust SMOS telemetry** — enables the telemetry to handle larger delay variations in the telemetry path

4. **RTP Monitor Filtering** — In addition to specifying a target IP address, a user can now also specify a port number.

5. **SIP monitor and T.38 Monitor log files** — To avoid user-unintended merging of multiple monitor results, the GUI will force a new log file name each time the enable log function is activated

6. **Test Configuration File Enhancements**
   a. A tester can now use the same cfg file under both GUI mode and CLI mode

   b. A 96x can load a test configuration file created by another unit. So, the "unit" command under the CLI (command language interface) now supports two new optional parameters
      1) savecfgas - Save current config file with a new name
      2) loadcfg - Load another config file

7. **Expanded ISDN Message Decoding** — For more complete decoding of ISDN D-channel messages, the GUI is now aware of an additional 16 message types and an additional 23 information elements

8. **Improved PCM Sensitivity** — The span provisioning combinations below are listed in order of increasing receive sensitivity when connected to a Monitor jack of a DSX patch panel:
   1) 100 ohms, Terminate, Short Haul
   2) 100 ohms, Monitor, Short Haul
   3) 100K ohms, Terminate OR Monitor, Short Haul
   4) 100 ohms, Terminate OR Monitor, Long Haul
   5) 100K ohms, Terminate OR Monitor, Long Haul

9. **Remember the Last 4 Test Configuration Files** — The GUI will now remember the last four ".cfg" (Test Configuration) files used. At the top menu bar, clicking on "File" will display the last four files that were active, and allow you to select any one of them for the current test session.

10. **2-Wire PVIT Test Restricted to TX or RX** — To eliminate user error, the "Send and Receive" selection is now greyed out when testing with a 2-wire analog interface. This is because the "sidetone" reflection of the local 2- to 4-wire hybrid on 2-wire circuits could cause the PVIT test to give erroneous results.

11. **Detached Results Window Moved to Foreground** — When a user presses the side button to create a 'tear-off' results window, a new floating window is created. Previously, if one already existed, but was hidden behind the main GUI window, it appeared to the user that nothing happened. Clicking on the side button now brings the hidden previously opened window to the foreground.

12. **PCM Signaling Bits Display is Now Non-Modal** — Previously, if a user opened the Signaling Bits display, he could not keep it open to watch the signal bits of one span while accessing a test window. Instead, the user would have to close the Signaling Bits display before doing anything else.

    Now, the Signaling Bits display can remain active while you go to another test screen. Also, you can set the audio monitor characteristics while in the Signaling Bits display so you can hear circuit audio by simply clicking on the desired channel in the display.

13. **On SIP Calls, Status Tab Displays Phone Numbers** — now, the Status tab of a test "Director" has a field displaying the destination phone number, and the Status tab of a test "Responder" has a field displaying the responder's phone number

14. **PCM Capture Progress Bar Added** — Now, when PCM Capture is started, a progress bar is displayed as the capture proceeds.

CORRECTIONS

1. **Dialing Pause Character Changed to Dash** — Previously, a "p" was allowed, however that can create a problem when a user wants to transmit an MF "ST2P" digit. The use of a dash ("-") character now aligns the 96x with other Sage products such as the 935AT and 925VST.

2. **Corrects Numerical Artifacts in the G.168 Test When Echo Canceller NLP Is Activated** — Previously numerical artifacts could occur when the returned echo level dropped rapidly from -10 dB to below -90 dB (for example, after NLP is turned on)

3. **RTP Monitor Corrects Reported Payload Type Number** — Corrects a defect where the PT (Payload type number) field the DSP reports to the host during RTP_MON special telephone events monitoring may be incorrect

4. **For SIP calls, RTP address string no longer reverts to the SIP server's IP address** — Corrected a defect in the SDP (session description protocol) parser: when the specified RTP address string exceeded 15 characters, the parser would revert to the SIP server's IP address

5. **One-Way Delay Inaccuracy Fixed** — Corrected a defect where one-way delay measurements gave inaccurate results in DS1 mode when both spans were sending and measuring on different channels

6. **Corrects RTP Monitor Reported Stream Direction** — Corrects a defect where the RTP monitor function could report an incorrect RTP stream direction

7. **Now Reports PCM Alarms in E1 Mode** — Corrects a defect where the 96x, would not report PCM alarms when configured for E1

8. **Ping Server Now Works on Ethernet Test Access Ports** — The "Echo Ping" function was broken in the Sage 960 GUI v7.4.23 software release. It now works again.

9. **Echo Sounder "Run" Button Now Clears Previous Results** — When the user clicks the 'Run' button, the previous results are now cleared. This enables the user to clearly see when new results are reported.

10. **Importing a .cfg File Will No Longer Crash the GUI** — Previously, if tests were running while a user imported another .cfg (test configuration file), the Sage 960 GUI (graphical user interface) program would crash. Now it doesn't.

11. **Transmitting a WAV File on E1 Interface No Longer Clips Audio** — Previously, when you used the Send/Measure Tone function to transmit a previously stored WAV audio file over a 96x E1 port, you could encounter clipping of the audio signal. This no longer happens.

KNOWN DEFECTS

1. **G.168 Test #9 is Missing a 30 second Wait Period** — The 960B does not wait the requisite 30 seconds before starting Test 9.

2. **ISDN D-Channel Doesn't Show up in Monitor Mode** — If a user changes a PCM span "Supervision/Signaling" mode from CAS directly to ISDN monitor mode, the D channel will not show up. The work around is:
   a. Change from CAS to ISDN *terminate* mode first (the D channel will be displayed)
   b. Then, change from ISDN *terminate* mode to ISDN monitor mode