

MFP

TT-050415_1

**TECHNICAL
TIP**

Models: All MFPs

Priority: Medium

Date: May 2015

Subject: G3 Fax Over VoIP

Symptom: G3 Fax Communication Failures When Using VoIP

G3 Facsimile Transmission Using VoIP Technology

The growing popularity of Voice over Internet Protocol (VoIP) as a cost-effective replacement for traditional Public Switched Telephone Network (PSTN) systems has created compatibility issues for G3 facsimile devices when used on VoIP networks. This Bulletin provides background information and offers suggestions to help improve compatibility.

1. What is VoIP?

Voice over Internet Protocol (VoIP) technology allows users to make voice calls through a broadband Internet connection rather than an analog phone line. VoIP services convert the voice call into a digital signal that travels over the Internet in the form of data packets. Through these services, companies may be able to avoid paying for both a broadband connection and a traditional telephone line. Using VoIP, calls can be made from a computer, a VoIP-designed phone, or a traditional telephone using an adapter.

2. How does the wider use of VoIP systems affect the use of G3 Facsimile Devices?

G3 Facsimile Devices, such as those available with many Sharp MFP systems, are designed for use with analog Public Switched Telephone Network (PSTN) systems; therefore, some compatibility issues may occur when using these devices with VoIP systems. Experience has shown that there has been successful implementation of Sharp G3 Fax-enabled MFPs in VoIP environments. However, it should be noted that not all installations are issue free. This document offers suggestions to help mitigate these circumstances.

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3. When a customer asks why they are having a problem with their Sharp G3 fax-enabled MFP on their VOIP network, the points below should be explained to them.

- VOIP is a digital technology. It uses advanced compression to make the data packets smaller for greater efficiency and it is optimized for voice communication.
- VOIP networks typically use lossy compression techniques. Lossy compression means some of the data is “lost” or thrown away in favor of compressing the data. In the case of lossy data compression for voice, a person can hear any imperfections in the conversation and still understand what the other person is saying. However, in the case of lossy data compression for fax signaling, the remote machine may not hear the complete signals and may report an error, or the communication may fail.
- Another common issue with G3 fax communication on a VoIP network is “jitter”. Jitter occurs when the message signal is interrupted with small gaps of near silence. These gaps are only hundredths of a second when they occur, and the human ear would not likely detect them on a voice call. However, the receiving fax can notice these and cause the exchange of signaling to become unsynchronized, which may also result in an error or communication failure.
- G3 fax was designed to work on the PSTN, which is an analog network that allows exact signaling. Lossy compression used in VoIP networks does not guarantee this. However, you can maximize the likelihood of success sending and receiving G3 fax over VOIP by working with your VOIP provider and using the information contained in this document.
- The most reliable way to ensure optimum G3 fax communication is to use an analog phone line.

4. What can be done at the MFP’s location to improve compatibility?

Sometimes it can be as simple as asking the user to make sure that they are employing a VoIP service with a high-quality voice signal. Other times, a VoIP telephone adapter may allow the Fax Kit to function with the user’s VoIP system. However, the customer should be advised to work with their VoIP provider to investigate and support these items. The best practice is for the customer to be aware of these guidelines before implementing VoIP technology in their environment, but oftentimes the G3 fax-enabled MFP is being installed within an existing VoIP network. In these situations, these points below regarding the VoIP environment should be considered as ways that may help minimize problems.

- Codecs used on VoIP networks:
 - Recommend T.38 Fax Relay (Real Time Group 3 Communication over IP Networks).
 - The use of G.711 μ -law type or Compressing Codec, such as G.723, G.726, and G.729, is not recommended.
- Packet Loss Rate should be less than 0.2%.
- Delay Fluctuation should be less than 140 ms.

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5. Can MFP settings improve VoIP compatibility?

There are some MFP-based settings that can improve MFP/VoIP compatibility. The following are the suggestions for the MX-FX11. Before trying them, it is recommended that you first check and upgrade the MFP and Fax to the latest available Firmware version. The current Firmware version is available from the Sharp PC-Service Web site at <http://www.sharp-idncservice.com/Firmware-Library>. Also, refer to **TT-20407** for additional information. The settings shown below may help resolve an issue when using a Sharp G3 fax-enabled MFP on a VoIP network.

A. Poor Transmit (TX) but Receive (RX) is fine:

- Lower the TX baud rate to 14.4 Kbps or 9600 Bps
 - 1) You must first disable V.34 for TX. Set Fax Soft Switch 27 bit 4 = "1": V.34 invalid in TX.
 - 2) Set fax soft switch 29 Bits 3 to 6 = "0100": for 14400 bps or "0001": 9600 bps.
- Also try setting Fax Soft Switch 33 bits 6 and 7 to enable Transmission Cable Amplitude Equalizer. Use the following patterns from lowest to highest:
 - "00": 0 dB
 - "01": 4 dB
 - "10": 8 dB
 - "11": 12 dB

B. On RX/TX will connect, one page or two will go, then fails or fails right away:

- Check the following items
 - 1) Make sure the phone patch cord is a 2-conductor patch cord.
 - 2) Confirm that the phone system is VoIP.
 - 3) Lower the TX/RX Baud rate (Item A from above)
 - 4) Turn off ECM. Set Fax Soft Switch 103 Bit 6=1 to turn off ECM.
 - 5) Turn off V.34 protocol. Set Fax Soft Switch 27 Bit 4 = 1 (RX) and Bit 5 = 1 (TX)
 - 6) Enable Digital Line Network. This setting is a checkbox found under System Settings -> Image Send Settings -> Fax Settings -> Default Settings: If the checkbox named as Digital Line Network is marked, the signal outgoing level of Fax is set to -15 dBm.
Note: This setting option is not available on all Models.
 - 7) Set RX/TX speed 14.4 Kbps. Set Fax Soft Switch 29 Bit 3-6 = 1111(TX) and Bit 7&8=11(RX).

C. Fax works all day long but jams overnight:

- Disable Nighttime Fax Mode.
 - 1) Set Fax Soft Switch 154 Bits 2 & 3= 1 (not to enter the Nighttime Fax Mode).

D. When Fax is in Power-Save Mode, it will not pick up:

- Set Fax to Pseudo-Nighttime Fax Mode.
 - 1) Set Fax Soft Switch 97 Bit 7 ="1": Enter the Pseudo-Nighttime Fax Mode (60W is notified).

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E. Fax works fine manually but not in the PC Fax or Memory-Dial Mode:

- Check the following settings
 - 1) Check Fax Soft Switch 8 Bit 8=1(Line Current Detection at times of dial calling). Change to 0 (Current Check ON).
 - 2) Check Fax Soft Switch 9 Bit 7=1(Dial Tone Detect ON/OFF) change to 0 (OFF).

F. Fax RX is not working but TX is OK:

- Check the following settings
 - 1) Confirm Fax is set to automatic answer.
 - 2) Confirm the Fax is set for the right country code: Check setting of Sim 66-2: Used to enter a country code and set the default value for the country code [U.S.A. is 10110101].
 - 3) Try setting Fax Soft Switch 102 Bits 2-5 to 0010 Set the number of call sounds until the start of receiving (holding of the line) when automatic reception is set.
 - 4) Try setting Fax Soft Switch 34 bits 1 and 2 to enable Receive Cable Amplitude Equalizer. Use the following patterns from lowest to highest:
 - "00": 0 dB
 - "01": 4 dB
 - "10": 8 dB
 - "11": 12 dB
 - 5) Try setting Fax Soft Switch 72 Bit 6 to 1 to turn off ECM.
 - 6) Try setting Fax Soft Switch 27 Bit 4 to 1 for V.34 invalid RX.
 - 7) Try setting Fax Soft Switch 29 Bits 7&8 to 11 to set RX speed to 14400 bps.

G. Fax is frozen and unresponsive:

- Check the following settings
 - 1) Try executing Sim 66-10: Used to clear the Fax and Image Send image data. (The confidential data are also cleared.)
 - 2) Check setting of Sim 66-2: Used to enter a country code and set the default value for the country code [U.S.A. is 10110101].

H. Fax not working to certain Fax # or to a Fax Server:

- Try setting Fax Soft Switch 16 Bits 1-3 from "000" to "001."

The information contained within this document is for troubleshooting purposes only to help resolve the issue described. This information is not officially supported by Sharp Electronics Corporation and no warranty is provided, written or implied. Design and specifications are subject to change without notice.

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