

G3 Codecs - Serial Data Operation

1.1. Purpose

To allow simultaneous streaming of audio and serial data over the same connection.

1.2. Software Requirements

Firmware version 1.6.xx.

1.3. Hardware Requirements

A 9 pin serial data cable wired pin for pin must be used when using Flow Control. A crossed over, three-wire serial cable can be used with Flow Control disabled. A null modem cable will not work.

1.4. To enable Serial Data Transfer on Tieline G3 codecs select:

[Menu] > [Configuration] > [Advanced Menu] > [Serial Port Mode] > [Data] > [Serial Port Mode] > [Data] > [*desired port rate*] > [Serial Flow Control →Enable←] > [Reboot System →Yes←].

Serial Port Rate Note:

The serial port rate must match the flow rate of the peripheral equipment or PC communication port that the codec is connected to. Most PC Com Ports are 9600 by default.

Flow Control Note:

In **Enable** mode, the connected equipment must have Flow Control set to "Hardware". This function provides 50 baud transfer rate (50 bits per second). This is approximately equal to average typing speed. Exceeding this rate could possibly result in data loss.

1.5. Tieline Codec Default Serial Settings

Serial Port Mode: Tietool (Default)
GSM
Data

Serial Port Rate: 115200 (Default)

Serial Flow Control: Disable (Default)
Enable

1.6. Caveats

To maximize throughput and to achieve the specified 50 baud transfer rate (50 bits per second), the following caveats should be observed.

- ✔ Connecting **Tieline** ToolBox is not recommended at either end of your link; and
- ✔ All remote control features should be disabled.

1.7. Limitations

- ✔ Data is not guaranteed to be transferred and can be lost;
- ✔ Packet loss can occur at any time on the GSM/POTS/ISDN/IP link;
- ✔ Data corrupted over the link will be discarded;
- ✔ A 1K (1024 byte) buffer is provided to smooth out data flow to prevent data loss. If the buffer is overflowed then the new data will be discarded without notice until the buffer is no longer full; and
- ✔ The RS232 channel should not be used in mission critical applications.

1.8. Guaranteed Delivery

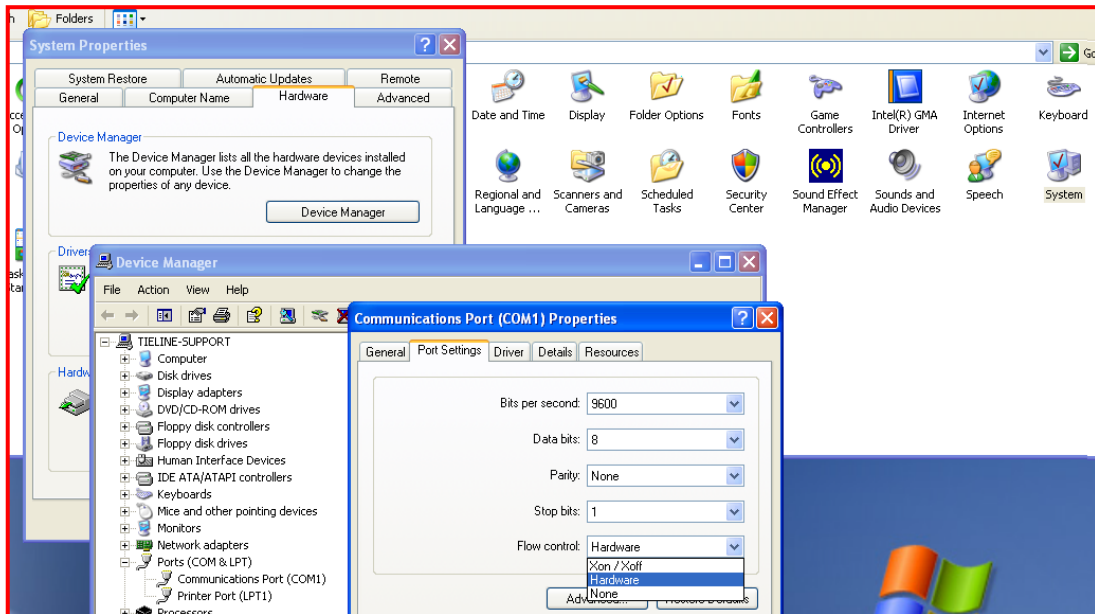
If you require guaranteed delivery of data you should use a higher level protocol like Kermit, XModem or ZModem on top of the RS232 codec connection. Windows®¹ provides these protocols in the communication application, Hyperterminal.

Alternatively, purchasing the "Captioning" feature for your G3 codec will ensure reliability of one third of the bit rate in use. I.e. If you are using a bit rate of 28.8 kbps, a reliable throughput of 9.6kbps could be expected.

¹ Windows is a registered trademark of Microsoft Corporation in the United States and/or other countries. Other product names mentioned within this document may be trademarks or registered trademarks, or a trade name of their respective owner.

1.9. To set a Windows XP PC to 'Hardware' Flow Control via Device Manager

1. Select: [Start] > [Settings] > [Control Panel] ;
2. Double click the left mouse button on "System" and select the "Hardware" tab;
3. Select the "Device Manager" button;
4. Double Click on: "Ports (COM & LPT)";
5. Double Click on: "Communications Port (COM 1)";
6. Select the "Port Settings" tab;
7. From the pull down menu next to "Flow control" select "Hardware"; and
8. Select "OK" to close the windows where necessary.



1.10. The Serial Port (RS232) Auxiliary Data Channel for MP2 and Tieline Music Connections

The RS232 connection on **Tieline** codecs is capable of sending in-band data between two codecs using either **Tieline Music**, *MusicPlus* or *MP2* algorithms. In-band data is encoded in the same bit stream as the audio that is sent between two codecs. Simply configure your RS232 connection to send data, turn serial port flow control on and you are ready to go.

If you are connecting over POTS, 50 bits of in-band data is available per second using **Tieline Music**. Over other connections, i.e. ISDN, IP etc, up to 200 bits per second may be available using **Tieline Music**. This algorithm will provide greater data sending capabilities if more channels are bonded together, i.e. by increasing the amount of B channels that are bonded using **Tieline Music** (this algorithm uses **Tieline** bonding).

Using MP2, a 64 kbps connection will provide a maximum data rate of 30 characters (240 bits) per second over ISDN, X.21 and IP. Unlike with Tieline bonding, with CCS bonding this rate will not increase - even if you bond more than two channels together.

Please Note: If you are using the serial port for data and you are using ToolBox software for controlling your codecs, you will need to connect to a PC using either the LAN or USB port on the codec.

1.11. Glossary of Terms

1.11.1. Serial Port Rate (Flow Rate)

Data (bytes representing letters, pictures, etc.) flows into and out of your serial port. Flow rates (such as 56k (56000) bits/sec) are (incorrectly) called "speed". But almost everyone says "speed" instead of "flow rate".

It's important to understand that the average speed is often less than the specified speed. Waits (or idle time) result in a lower average speed. These waits may include long waits of perhaps up to a second due to Flow Control. At the other extreme there may be very short waits (idle time) of several microseconds between bytes. If the device on the serial port (such as a modem) can't accept the full serial port speed, then the average speed must be reduced.

1.11.2. Flow Control

Flow control means the ability to slow down the flow of bytes in a wire. For serial ports this means the ability to stop and then restart the flow without any loss of bytes. Flow control is needed for modems to allow a jump in instantaneous flow rates.