



Telephone Data Collection & Response Unit

Programmer's Interface Guide

Revision 1.0 - 01/11/2007

(Master Processor Version 1.0 and above)



ID Voice

Technical Manual

[V1.0- 11/01/2007]

Introduction

ID Voice is a stand alone, 2 line telephone to computer interface. Through software control, it will answer an incoming phone call, identify the caller's phone number via Caller ID, deliver voice prompts, and collect Touch Tone (DTMF) responses. It is an ideal device for developers creating business solutions which require remote data collection from users calling from remote locations using land lines or cell phones.

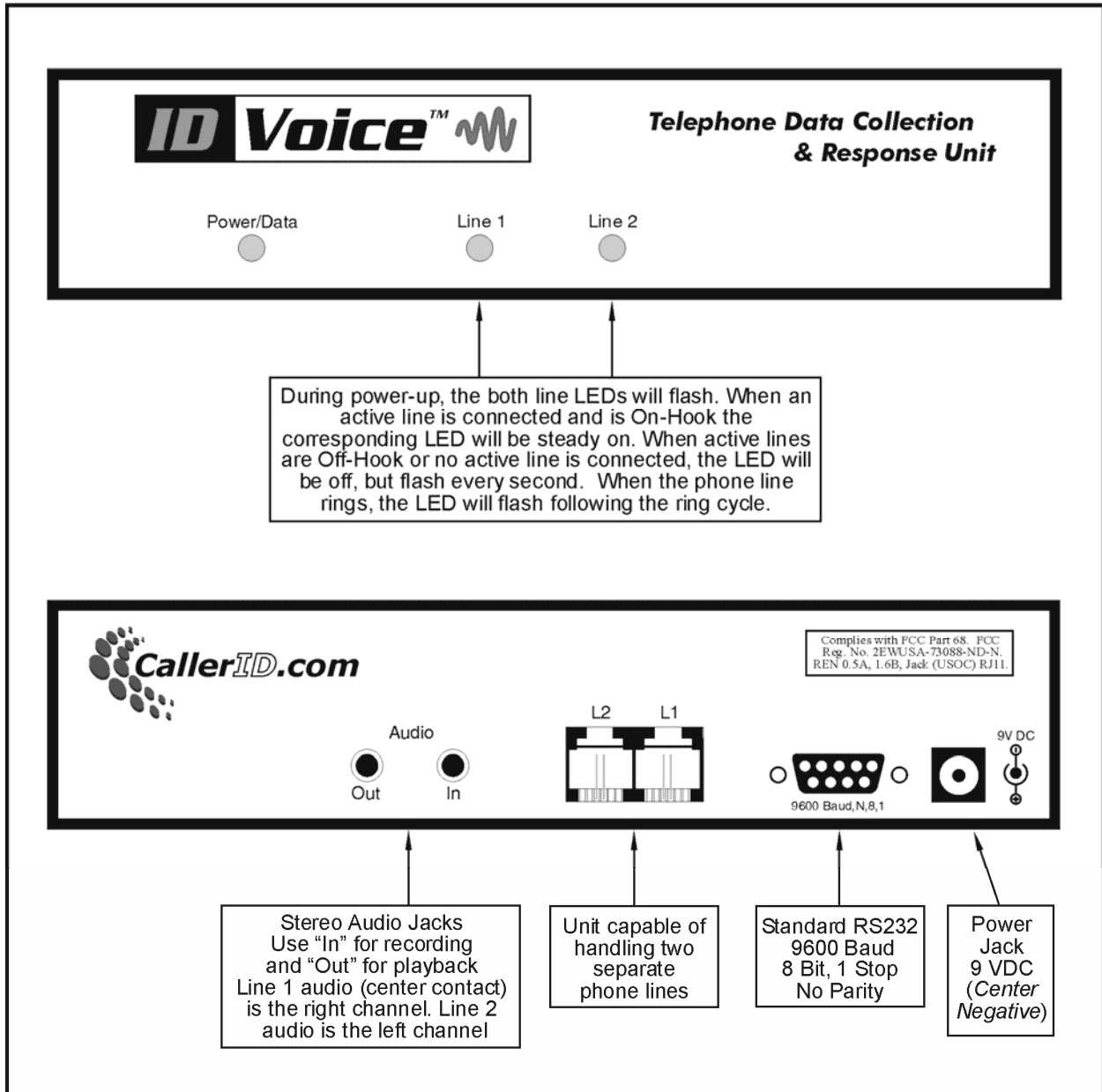
Typical applications include:

1. Remote employee check-in and check-out.
2. Inventory management.
3. Job ticket completion.
4. Security time stamps.

In a typical application, a user makes a phone call which is answered by the ID Voice. The caller's phone number is collected with Caller ID and sent to a host computer where it is logged and verified. A greeting message is played by the ID Voice asking the user to enter data with DTMF digits. Once collected, this data is sent to the host computer for verification. If the data is bad, the host computer will signal ID Voice to play an error message and re-collect the information. If the data is acceptable, the host can continue instruct ID Voice to collect more data, play an announcement, or simply hang up. A multitude of data collection sequences can be processed.

Custom voice prompts are easily recorded and then downloaded via the host computer into ID Voice. These are stored in non-volatile memory. ID Voice automatically reacts to timeouts, hang-ups, or dead phone lines.

Front and Back Views of Unit



Host Computer Interfacing

Establishing RS232 Communication

Interfacing between the host computer and ID Voice is accomplished via standard RS232 serial link. The protocol is 9600 BAUD, 8 bits, no stop, and no handshaking. A standard straight through, 9 pin, serial cable is used.

Use any terminal application to establish communication with ID Voice. All commands sent and received are ASCII text so they are easily viewed in any terminal program such as HyperTerminal. Refer to Appendix B, "Using HyperTerminal to Communicate" for detailed instructions.

When an incoming phone call is answered by ID Voice, it first sends a data stream to the host computer. This data will include the Line Number (01 or 02), the time of the call, caller's phone number (from Caller ID), and the callers name. Refer to the section below entitled "Initial CallerID information".

ID Voice will wait for instructions (commands) from the host. These commands will tell ID Voice to:

1. Play an announcement and hang-up.
2. Play a prompt and collect a number of DTMF digits.
3. Continue to play prompts and collect more input.
4. Hang-up.

Host commands can also instruct ID Voice to add "beeps" after a voice prompt, if needed. Communication from the host computer to ID Voice is done with a 10 digit command data stream. This stream is always sent starting with a capital "N", followed by: the line number, the number of DTMF digits to collect, the voice prompt number, a checksum, and a one character instruction code. The stream is terminated by a carriage return/line feed.

Details of this command format are defined below:

- A. The command structure is **NLLddvvcca** where

N - the "N" character
LL - the line number (01 or 02)
dd - the # DTMF digits to collect (00 through 99)
vv - voice file number 1-16
cc - checksum
a - single letter instruction code (**G, Q, Z, B, P, R, or S**)

Note: The checksum is a two character number and is calculated as $(8 \times LL) + dd + vv$.
For example, if the command line was "**N020312ccG**",
the "**cc**" checksum would be calculated as $(8 \times 02) + 03 + 12$ equals 31.
Consequently, the whole command sent to ID Voice would be "**N02031231G**"

- B. The instructions codes are defined as:

G - Play beep prompt after voice
Z - Play voice prompt, but no beep prompt
Q - Play voice (if any) and hang-up.
B - Play voice, Report a "D" to host when done, do not hang-up

Note: All the above commands are required to adhere to the "**NLLddvvcca**", 10-digit command structure. Some elements of a command will be ignored if not used. For example, the device will ignore the "**dd**" data when the "**Q**" command is sent.

Upon boot-up, ID Voice will send the host two data streams, one from each line. It will consist of the line number and the firmware version number of the channels processors. The following would be a typical boot up sequence:

```
01 v02
02 v02
```

If the host sends a “V” command, the ID Voice will respond with the firmware version number of the master processor, the date, and the time. Note that ID Voice sets its internal clock from inbound Caller ID, so it will not have the correct date and time until a phone call is received.

Voice Prompts

Voice prompts are recorded messages and retained in non-volatile memory. Commands from the host computer instruct the ID Voice what prompts to play and when. Some prompts may tell the caller to input DTMF data, while other prompts would simply play an announcement. The voice memory is a total of 120 seconds long and is divided into 20, six-second slots. Slots 1 and 2 are reserved for system prompts, while slots 3 through 20 are used to record any other prompts needed. A recorded prompt that is longer than 6 seconds will spill into subsequent slots. Refer to the section below entitled “Message Length Management” for recording messages greater than 6 seconds.

The recording of prompts is accomplished by sending ID Voice a start record command which contains the line number and prompt number. ID Voice will immediately start recording the audio presented on “Audio In” jack located on the back of the unit. During the recording process, the line LED will flash rapidly. When the recording is finished, the host sends a “Stop Recording” signal.

This 2 line ID Voice unit requires that each line has its own prompts recorded separately. In most cases, you will want to create voice prompts on the host computer as WAV or MP3 files and subsequently, send them to ID Voice. To send files this way, connect a stereo cable between the “Line Out” jack on the host computer and the “Audio In” jack on the ID Voice unit.

Record & Playback commands

The commands associated with recording and playback are sent to ID Voice in the normal format as described in the previous chapter “Host Computer Interfacing”. In review the command structure is **NLLddvvcca**.

The last character in the structure, “a” is the following for recording and playback:

```
P - Play numbered voice message "vv"
R - Record numbered message "vv"
S - Stop recording message
```

As defined in the “Host Computer Interfacing” section, the command structure is **NLLddvvcca**

The letter **N** preferences all commands.

The character string **LL** will be a **01** or **02** for the line number.

The string **dd** must be **00** for recording and playback.

The voice prompt number is **vv** (**01** - **20**),

The string **cc** is the checksum, calculated as defined previously: $(8 \times LL) + dd + vv$.

A carriage return/line feed terminates the command.

Examples of command strings are below:

```
N01001422R - instructs unit to start recording prompt 14 on line 1.
N01001422S - instructs unit to stop recording prompt 14 on line 1.
N02000925P - instructs unit to play prompt 9 on line 2.
```

Playback

While going through the process of recording prompts, it is often convenient to playback the newly recorded prompts through a speaker phone. The following instructions describe two methods of accomplishing this.

One phone system

Connect both a standard phone and the ID Voice to a “live” phone line. Pick up the phone as if you are making an outgoing call. Dial the digit “1” so that the dial-tone will cease. Send the ID Voice the playback commands as described in the above section. You will have 15-20 seconds to listen to prompts before the phone company will send a dialing error message.

Two phone system

Plug in ID Voice and a standard phone as described above. Pick up the phone and place a call to another phone line in your office (or your cell phone). Answer the call and leave both phone off-hook to keep a talk path open. You will be able to hear voice prompts on both phones.

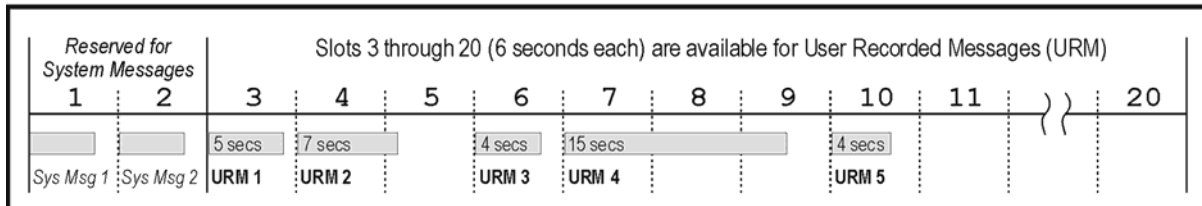
Notes on Recording:

It will take some experimentation to set your recording levels that give the best overall sound quality. Recordings that are too loud will cause distortion. If the same personnel will be caller frequently, it is best to keep your prompts short. The prompt “Enter 4 digit Employee ID” is better than “At the sound of the tone please enter your four digit employee ID number”. Of course, new or infrequent callers will require longer, more helpful prompts.

Message Length Management

It is important to note that the system locates the start of each prompt based on 6 second intervals. If a recorded prompt is longer than 6 seconds, it will run into next time slot. You would need to skip a slot to record the next message. Since the first two slots are reserved for system messages, assume you recorded your first message in slot #3. This message lasts 7 seconds. For proper operation, you would need to skip slot #4, and record your next message in slot #5. See the example timeline below showing proper recording management when some messages are longer than 6 seconds.

Timing Chart for User Recorded Messages



In the example above, the user recorded message (URM) 1 is recorded in slot #3 since the first two slots are reserved for system messages. URM is recorded starting in slot #4, but since it is longer than 6 seconds, it runs into slot #5. Therefore, URM 3 needs to be recorded starting in slot #6. URM 4 starts in slot #7 but runs all the way through to slot #9, so UMR 5 needs to be recorded in slot 10.

System Messages

Two system messages #1 and #2 are reserved for error prompts. Prompt #1 will play if the unit times out because of no response from host. Prompt #2 will play if no response from user. These two prompts will come recorded from the factory, but you can re-record them to give your whole system will have a uniform feel. In order for ID Voice to function properly, recorded system messages must be present and not exceed 6 seconds.

Prompt #1 - “Host computer down, please contact your administrator”

Prompt #2 - “The system did not detect your response, please try again”

Recording Software

Contained on the enclosed CD, a program called "EasyRecord" makes it easy to record recording voice prompts and download them to ID Voice.

Line Monitor/Recording

The "Audio out" jack on the back of ID Voice allows monitoring or recording of telephone audio. Line #1 audio is presented on the Right channel and line #2 on the left.

Additional Information

1. RS232 data sent from host to ID Voice does not use carriage return/line feed characters after a command string.
2. RS232 data sent from ID Voice to the host computer does terminate with a carriage return/line feed.
3. If no response is detected from the user or host for 10 seconds, ID Voice will hang-up the telephone connection and send "01Q" or "02Q" to the host.

Technical Support/ Troubleshooting

We are happy to provide free lifetime technical support. Before calling, please read this entire manual and run the program "WC Toolbox", found on the CD or downloaded from **www CallerID.com** under the section: Downloads > Diagnostic Tools. It will help you test your serial port and communication with ID voice, as most problems with ID Voice stem from the configuration of the serial port on the host computer.

Manufacture's Information

CallerID.com
5680 Oakbrook Parkway, Suite 150
Norcross, GA 30093

Sales	(800) 240-4637
Customer Service	(770) 263-7111
FAX	(770) 263-0049
Web Site	www CallerID.com

Warranty Information

CallerID.com will repair this product with new or rebuilt parts, free of charge, when returned postage prepaid to the CallerID.com repair facility in Norcross, GA within 2 years from the date of original purchase.

This warranty is extended only to the original purchaser. A purchase receipt or other acceptable proof of purchase date will be required before warranty service is rendered.

This warranty covers failures due only to defects in materials or workmanship occurring during normal use. It does not cover damage which occurs in shipment; failures which are caused by products not manufactured by CallerID.com; failures which result from accident, misuse, abuse, neglect, mishandling, misapplication, alteration, modification or unintended use of product; service by anyone other than an authorized CallerID.com repair facility; or damage attributed to an act of God. Lightning is considered an act of God.

CallerID.com makes no other warranty, either expressed or implied, with respect to this product.

If a problem develops concerning this product, contact your local dealer or CallerID.com directly for a Return Material Authorization (RMA) number. A RMA number is required for all returns.

Appendix A - Quick Reference List

Host Computer Commands

Command structure: **NLLddvvcca**

- N** - the "N" character
- LL** - the line number (01 or 02)
- dd** - the # DTMF digits to collect (00 through 99)
- vv** - voice file number 1-16
- cc** - checksum $\{(8 \times \text{LL}) + \text{dd} + \text{vv}\}$
- a** - single letter instruction code (**G**, **Q**, **Z**, **B**, **P**, **R**, or **S**)

Instructions codes:

- G** - Play beep prompt after voice
- Z** - Play voice prompt, but no beep prompt
- Q** - Play voice (if any) and hang-up.
- B** - Play voice, Report a "D" to host when done, do not hang-up

Record and Playback commands:

- P** - Play numbered voice message
- R** - Record numbered message
- S** - Stop recording message

- N02000925P** - instructs unit to play prompt 9 on line 2.
- N01001422R** - instructs unit to start recording prompt 14 on line 1.
- N01001422S** - instructs unit to stop recording prompt 14 on line 1.

Data Sent by Unit to Host Computer

DTMF Digits

- A** - caller entered all of the digits requested.
- T** - caller entered but not all digits requested.
- 02A1234** - caller on line 2 entered all digits requested which were **1, 2, 3, & 4**.
- 01T12** - caller on line 1 entered only the digits **1 & 2**.
- 02T** - caller on line 2 did not enter any digits

Other Events

- nnG** -Good command string data received [Ex. **01G** – Command received on line 1]
- nnZ** -Bad command string data received [Ex. **02Z** – Bad command received on line 2]
- ?** -Received unrecognizable command, malformed command string, or character
- #** - unit response when host computer sends the "@" character.

nnQ – caller hung up on line nn
[Ex. **01Q** – hang up on line 1]

nn Vxx - Power up sequence with firmware version of channel processor
[Ex. **01 V15** – Channel 1 contains processor firmware version 1.5]

VTCxx mm/dd hh:mm:ss – response from unit when host sends a **V** command. **VTC** is followed by the master processor firmware version, month, day, hour, minute, and seconds.
[Ex. **VTC12 01/15 14:26:00** – master firmware version 1.2, date and time is January 15th, 2:26 pm]

Appendix B - Using HyperTerminal to Communicate

RUNNING HYPERTERMINAL

1. Make sure that any software program that runs in conjunction with "Whozz Calling?" is closed.
2. Select "Start", then "Run", type **Hypertrm.exe**, and select **OK**.
3. In the Connection Description dialog box Type: "**Test**" on the Name line and Select: **OK**
4. In the Phone Number dialog box leave phone number blank and Select: Connect using **Direct to COMx**. Where "x" represents the COM port number being tested (ex. 1,2,3, etc.). Select: **OK**
5. In the Properties dialog box Select Bits per second: **9600**, Data bits: **8**, Parity: **None**, Stop bits: **1**, and Flow Control: **None**. Then Select: **OK**
6. Select: **File/Properties**. In the Test Properties dialog box select the **Settings** tab and set Emulation to **ANSI**.
7. Type capital "V".
 - a) If a string is returned similar to: "VTC03 00/00 00:00:21", the serial port is functioning properly and the unit will display information through Hyperterminal.
 - b) If you do not see a similar string, Select: **Call/Disconnect**. Select **File/Properties**, choose another COM port and click **OK**.
 - c) Select: **Call/Connect** and type capital "V" again. Repeat above as necessary until the above string appears.
8. If you obtain a positive result, skip to the section entitled "Capturing Data in a Terminal Program to a Text File." If not, go to the section entitled "Loopback Test for a Serial Port in Windows" to test if your serial port is transmitting and receiving properly.

LOOPBACK TEST FOR A SERIAL PORT CONNECTION IN WINDOWS

1. Make sure that any software module that communicates with COMM ports is closed.
2. Select "Start", then "Run", type **Hypertrm.exe**, and select **OK**.
3. If preliminary windows are displayed, type in any information necessary to continue past these windows until you get to the "Connection Description" window.
4. In the Connection Description dialog box Type: "**Caller ID Test**" on the name line and Select: **OK**
5. In the Phone Number dialog box leave phone number blank, go to the last row named Connect using and select **Direct to COMx**, where "x" represents the COM port number being tested (ex. 1,2,3, etc.). Select: **OK**
6. In the Properties dialog box Select Bits per second: **9600**, Data bits: **8**, Parity: **None**, Stop bits: **1**, and Flow Control: **None**. Then Select: **OK**
7. Select: **File/Properties**. In the Test Properties dialog box select the **Settings** tab and set Emulation to **ANSI**. Select **ASCII Setup** and make sure that Echo typed characters locally box is not checked. Select: **OK** to close and **OK** again to close the Test Properties box.
8. Remove the Loopback jumper from the vinyl pouch on the side of the unit.
9. Disconnect the serial cable from the unit while leaving the other end connected to the computer.
10. Orient the connector such that the row of 5 pins is on the top and 4 pins are on the bottom. Locate pins 2 & 3 on the cable (they are the second and third pins from the left). Push on the jumper to connect pins 2 to 3.
11. Type any character.
 - a. If the character you typed shows on the screen, the serial port is functioning properly, the test is positive.
 - b. If you do not see the character typed, Select: **Call/Disconnect**. Select **File/Properties**, choose another COM port and click **OK**.
 - c. Select: **Call/Connect** and type any character again and repeat above as necessary.

NOTE: If a fax/modem board is installed in your computer, the Loopback test performed on this COM port will give a false positive result. You can check to see if the FAX/modem is on the COM port your testing by typing "AT" and pressing the "Enter" key. A FAX/modem will return "OK".

12. If you obtain a positive result, go to "Loopback Test Successful". If not, you may have a conflict between your serial port settings and an internal device such as a FAX/modem. Consult your computer technician to resolve the conflict.
13. Please put the Loopback jumper back in the pouch for future use.

LOOPBACK TEST SUCCESSFUL

After a successful Loopback test, reconnect the unit and type a capital "V" (Shift "V"). The unit will respond with the firmware version number, setup toggles, line number of the first channel, and date & time. The unit is now communicating with the serial port. Note the COM port number to which you are directly connected.

Make a test phone call on each of the phone lines. If the phone call data appears on your screen, most likely the phone lines are connected correctly and the unit is working properly.

If you are using application software, exit your terminal program and run your application software again. If phone call data still does not appear in you application software, determine whether the software can be manually configured to the correct COM port. Contact your application software provider if problems still persist.

CAPTURING DATA IN A TERMINAL PROGRAM TO A TEXT FILE

Monitoring the output from the unit in a terminal program does not save data unless you capture it to a text file. If not captured, the data that scrolls off your screen is lost. When you enter your terminal program you must immediately set it to capture data to a file. Since terminal programs can be set to append data to an existing text file, you can capture data to the same file every time you run your terminal program.

From the HyperTerminal screen - Select: Transfer/Capture Text, and type text file name.

Appendix C - Requirements and Compatibility

COMPUTER REQUIREMENTS

The unit must be connected to a dedicated serial port on your computer that is free of COM port and Interrupt (IRQ) conflicts. If your computer does not have a 9 pin serial port available, a USB to 9 pin serial adapter cable will be required. These USB to serial adapter cables are available at any computer or Radio Shack™ store. They include a CD that contains drivers to create a virtual COM port on your computer.

It is not required that the serial port (or USB virtual COM port) reside on any particular COM number or IRQ value. This is important only to application software that you may be running in conjunction with the unit. The requirements for computer CPU speed, disk drive space, memory, and operating system are determined by the software application you are running.

Phone lines are connected to the back of the unit using modular jacks. Input and output ports are provided for wiring systems using 2 wire RJ11 connections. If the wiring coming into your building does not terminate in modular jacks, contact your telephone vendor to add these modular connections.

PHONE LINE COMPATIBILITY

The unit should be connected to the telephone lines coming into your building commonly know as the Central Office or “CO” lines. In order to capture Caller ID, an analog Caller ID signal must be present on the phone line. This signal must be sent directly from the phone company or regenerated by VoIP interface units. Analog Caller ID will not pass through telephone switches to extension lines. Even Caller ID compatible telephone switches do not pass or regenerate analog Caller ID signals to extensions lines. Units will not operate correctly if connected directly to digital phone lines.

The unit is compatible with the following types of telephone lines:

- Standard Local Loop (1FB)
- Analog Centrex
- Individual VoIP lines (I.E. Vonage)
- Fractional T1* (sometimes called a T1 VoIP)

* Note: T1 circuits terminated with External routers capable of separating and combining Voice and Data are, in fact, compatible with this ID Voice unit. These routers supply standard analog 1FB lines to the phone system.

The unit is NOT compatible with the following types of telephone lines:

- Ground Start (Trunk)
- ISDN PRI or BRI
- Analog Extensions from a phone system
- Digital Extensions from a phone system
- T1 terminated on a phone system
- Digital Centrex

Appendix D - RS232 Pin Outs

When the serial port is configured to “No Flow Control,” only **Transmit**, **Receive**, and **Ground** connections are required. Pin 7 and Pin 8 need to be connected only if other serial flow control types are selected.

Computer DB9/M Serial Port

Pin 1 (Carrier Detect)

Pin 2 (Receive)

Pin 3 (Transmit)

Pin 4 (Data Term. Ready)

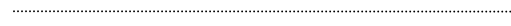
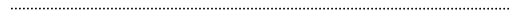
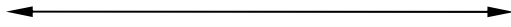
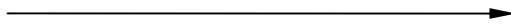
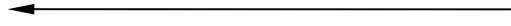
Pin 5 (Ground)

Pin 6 (Data Set Ready)

Pin 7 (Request to Send)

Pin 8 (Clear to Send)

Pin 9 (Ring Indicator)



Monitoring Unit DB9/E

Pin 1 (No Connection)

Pin 2 (Transmit)

Pin 3 (Receive)

Pin 4 (No Connection)

Pin 5 (Ground)

Pin 6 (Control Line between Units)

Pin 7 (Internal

Pin 8  Connection)

Pin 9 (No Connection)



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