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Service Note

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USING US ROBOTICS MODEMS WITH TELEDYNE API "E" SERIES ANALYZERS

I. PURPOSE:

BACKGROUND:
Teledyne API analyzers do not use hardware or software data flow control (also known as "handshaking"). This means that if the device that is connected to the Teledyne API requires a hardware signal to control it, the device will not communicate. With most devices, such as a computer, this is not a problem as the Teledyne API holds the CTS (clear to send) line true always. Most devices, if they use hardware handshaking, only require the presence of CTS. Modems, however, are different. When using hardware flow control most modems also require the presence of DTR (data terminal ready) or DSR (data set ready). This allows them to be backward compatible with older devices such as teletypes. If this signal is not present, the modem will not send data to the device. In order to make the Teledyne API analyzer work with a modem, it is necessary to program the modem to ignore hardware and software flow control. A definitive service note, covering all types and brands of modems, is beyond the scope of this document. Therefore, this document is limited to programming US Robotics Sportster modems. Teledyne API recommends that you use the US Robotics 14,400 BPS modem or higher.

***NOTE*: You must use a modem that has a faster baud rate than the baud rate you will be using. If you have a different brand of modem, you can try these instructions, however, it is advisable to consult your modem manual for the exact commands to enter into your modem for each step below, or refer to our "generic modem" service note #98-033. You can use just about any communications program, but for the sake of uniformity we recommend that you use the HyperTerminal program that comes with windows**.

II. TOOLS:

US Robotics Sportster, US Robotics V.92 Modem, or US Robotics Courier Modem
Computer with communications program (preferably HyperTerminal)
9 pin female to 25 pin male cable

III. PARTS:

N/A

III. PROCEDURE:

***NOTE*: We would suggest that you test the modems in-house before you take them to the site to install the system. If you have a phone system in-house that uses an exchange system, you will want to make sure that you use a dedicated line for the analyzer. If you don't have any dedicated lines in-house, you can use a telephone simulator. We have used the Teltone TLS-3A (see attached information) in-house to do our testing.**

1. Connect the computer to the modem using the 9 – 25 pin cable.
2. Start the computer and load a communications program. When you are setting up the communications program set the following items.
   Flow control Xon/Xoff
   Comm port what ever comm. port you are using
   Baud rate the baud rate that the analyzer is going to use
   Data bits 8
   Stop bits 1
   Parity none
3. If your modem doesn't have switches, skip this step. Locate the dip switches on the modem, set the switches to the following positions:
   Set switch #'s 2, 4, and 5 "OFF" (switches in up position).
   Set switch #'s 1, 3, 6, 7 (switch 10 for Courier), and 8 "ON" (switches in the down position).

U.S. Robotics Modem dip switches:

NOTE: If you are using the Courier model modem, set switch 7 to OFF and 9 to ON.

switch 1 on modem ignores DTR (DTR override)
off normal DTR operations: computer must provide DTR signal.
switch 2 on numeric results
off verbal (word) result codes
switch 3 on enables result codes
off suppresses result codes
switch 4 on suppresses echo
off displays keyboard commands
switch 5 on disables auto answer
off auto answer on first ring (or higher if specified in NVRAM)
switch 6 on carrier detect always on (override)
off modem sends CD signal when it connects, drops on disconnect
switch 7 on loads &f0 from ROM
off loads Y or Y1 config. from NVRAM

NOTE: For Courier Modem, this is switch 10.

switch 8 on smart mode (enables AT command set recognition)
off dumb mode (disables AT command set recognition)

down = on
up = off

4. Turn the modem on.
5. Verify that you have communication with the modem by pressing the Enter key on the computer 2 times, then typing "ATZ" and pressing the Enter key. The modem should respond with "OK" after a second or two.
6. Type in the following commands exactly as they appear here. After each command the computer should respond with an "OK". If it does not then you will have to try the command again. If it still does not reply with OK check the manual for your modem and find he command that equals the function that you are trying to set.

   ate1q0v1 enter modem displays keyboard commands (echo on)
   Displays result codes
   Verbal codes
   aty0 enter default is profile 0 setting in NVRAM
   at&d0 enter DTR override
   at&h0 enter flow control disabled
   at&i0 enter software flow control disabled
   ats0=2 enter sets auto answer to 2 rings

at&b0 enter sets serial port rate to follow the connection rate of the mode.
at&n10 enter sets connect speed of the modem to 19,200. If you are using an analyzer that cant goto 19,200 set this to at&n6 for 9600 or at&n3 for 2400
at&m0 enter normal mode, sets error control to off
ate0q1&w0 enter echo off
Does not display result codes (quiet mode)
writes current configuration to NVRAM 0 template

YOU WILL NOT GET AN OK AFTER TYPING THIS COMMAND

7. With the modem not connected to the analyzer, power on the analyzer.
8. Press the following buttons on the front of the analyzer: "SETUP-MORE-VARS. At some point you will have to enter a password. Change the password to 929 and press ENTR. Once in VARS, press NEXT until you get to RS232 MODE. Press EDIT". Change the number to 0 if it is not already 0.
9. Next change the baud rate in the communications menu to the 19,200. To do this, press "SETUP-MORE-COMM-BAUD-ENTER".
10. Turn off the analyzer.
11. On the modem, change the dip switches to the following positions
    Set switch #'s 2, 3, 5, and 7 (Switch 10 for Courier) to "OFF" (switches in up position).
    Set switch #'s 1, 4, 6, and 8 "ON" (switches in the down position).
12. Turn on the modem.
13. With the modem connected to the analyzer, power on the analyzer. Check to make sure that both the green and red LEDs on the rear panel are on. If they are not on then you will have to change the analyzer from DCE to DTE or vice versa. To do this there will be a switch on the rear panel (on the outside of the analyzer), right by the RS232 ports. Change the position of the switch on the analyzer and the green led should come on.
14. Now that you have the modem connected to the analyzer and programmed you should be able to hook it to the phone system and call it. With your computer hooked to the phone system call the analyzer. The modem will ring and answer on the second ring. Once the modem has established communication with your computer you should see the message "Connected at 19200" or similar. On the computer press Enter, then CTL-T (Hold the control button and press the "t" button). Then type a question mark (?) and press Enter.

15. You should get a menu of the commands for the Teledyne API. If you do not then you will want to check the setup again and make sure that everything is correct. If you can't make the computer talk to the analyzer try to go into the DIAG menu on the analyzer and push NEXT to get to the RS 232 output and push ENTR. You should see a long string of "W's". If you have a bunch of garbage on the computer screen then you probably have a baud rate problem.

If you have questions about this or any Teledyne API equipment, please contact a Teledyne API Customer Service Representative. If you are having problems with this setup procedure and are going to contact Teledyne API, please have the manual for the modem, the software rev of the analyzer, and the name of the communications program you are using on the computer.