



## AN152

### Trouble Shooting Serial Port Operation on AEA Equipment

Written by Bill Ashley for  
**AEA Technology Inc.**

#### **Abstract:**

Some of AEA Technology equipment connects to PC based software using an RS232 serial port. Sometimes a user experiences difficulties when attempting to connect the unit to the software. This paper outlines fault isolation methods and solutions for many of these problems.

#### **General**

The problems involving the serial port connection fall into a few major categories:

1. COM port settings
2. Software settings
3. Cable integrity
4. Other software on PC
5. AEA unit active

#### **RS232 Serial Port**

For AEA equipment the RS232 link has three portions:

1. PC Computer running the AEA application software.
2. The connecting cable (AEA part number 0070-1201 or 0070-1215).
3. AEA analyzer (many different models).

Verify the cable connects the analyzer to the PC.

The RS232 standard defines the voltage levels and other characteristics of a serial port interface. One of the basic parameters for RS232 operation is the Baud Rate. The PC software and the analyzer MUST be set to that same baud rate for successful communication. Verify that the baud rates match.

PC's will often have more than one RS232 port. The first one is COM1; the second is COM 2 etc. Be sure that the com port selected in the application software is the same one that the cable connects to.

#### **AEA PC Software**

There are several different models of AEA equipment and different PC programs for these units. Be sure that the program you are attempting to run is the correct software for the unit you wish to connect to. See Appendix A for a list of units and their software.



### **Serial Cable**

If you suspect the cable, use an ohm meter to check it out. Gently flex the cable near the connectors as you type in commands (see trouble shooting) to see if there is an intermittent. If the cable checks out OK, then look elsewhere for a problem.

### **Other Software**

Other software may be tying up the serial port. The two most common programs that do this are Windows® Briefcase program looking for a laptop to synchronize files with or a Universal Power Supply program left on the operating system. Many times these programs get imported from an older computer/configuration when you upgrade to a newer Windows OS or computer, so you may not even remember activating these programs. Run msconfig (Start|Run enter "msconfig" press OK) to find and deactivate any UPS and briefcase drivers or programs. These are usually found under the last 2 tabs, "Services" and "Startup". Reboot the computer and verify that the program has been successfully removed by examining the RS232 tester LEDs or by starting HyperTerminal.

### **AEA Unit plotting**

Be sure that the AEA unit is not in an exam mode or in the middle of some menu. It should be actively plotting in order to respond to serial port commands.

## **Trouble Shooting Tips:**

### **RS232 Tester**

Although not essential, an inexpensive RS232 tester module often proves to be a handy piece of test equipment to help with serial port issues. This module contains LEDs that show the activity on the different RS232 lines that make a com port. If you do not have an RS232 tester, then use the HyperTerminal program as explained further on. For AEA equipment, there would be 4 Active LEDs:

1. TD or TxD, data from computer.
2. RD or RxD, data from AEA equipment.
3. RTS, a handshake line from the computer to indicate if the port is "on line" or not.
4. DTR, behaves similarly to RTS.

If these LEDs are not lit, there is some type of hardware problem. With the AEA PC software not running (i.e. closed) the RTS and DTR LEDs should be the same color as the RD and TD lines (all inactive). If this is not true or if there is activity on these lines, then another program has the port tied up or you have connected to the wrong port.



## **Hyper Terminal**

Hyper Terminal is a Windows® program that may be started by:

Start|All Programs|Accessories|Communications|Hyperterminal

Enter any name for this connection and click OK. Then connect using COM 1 (or the COM port you wish to use). Then select the baud rate that the AEA unit is set to, 8 data bits, 1 stop bit, "none" parity, with xon/xoff handshake, then click OK or Apply. These get lumped together and are shown on the bottom window frame (e.g. 57600 8-N-1). If you got a message that says the port is in use by another program, you must shut that program down before you can use the port for the AEA software.

If HyperTerminal starts successfully, it will display "Connected" in the lower left corner. Type in a command (see manual for serial port commands). For Bravo, 20/20 TDR, and Echo models, use a single upper case R. There should be a long series of letters and numbers that print in the HyperTerminal window. If there is a single "garbage" echo character for each character sent, the cable is not plugged into the AEA unit, or there is an internal problem that acts like an open cable. Verify cable connection, if needed; check the serial port lines internal to the unit. If HyperTerminal successfully displays a response from the unit, you must closely examine the settings in the PC application software (appendix A).

NOTE: You must set HyperTerminal offline (or close HyperTerminal window) prior to starting up the AEA software.

## **USB only PCs**

Some PCs no longer come equipped with RS232 serial ports. To use the AEA serial port units on these computers, an RS232 to USB adaptor will be needed. Follow the instructions for the converter. You may need to experiment with software settings in the translator.

## **Try a Different Computer**

If you can get another computer to communicate with the AEA unit, then there is a problem with the software/settings on the new computer. If the second computer also doesn't operate, the results are still inconclusive since it is still possible for that the problem (settings or other software) occurs on both computers.

## **Conclusion:**

By using simple techniques, you can isolate and remedy problems that cause most serial port failures with AEA equipment. On rare occasions, the problem will exist within the AEA unit, which would need to be sent to the factory for repair (obtain RMA# first)



## Appendices

### Appendix A AEA unit vs. Software

AEA Model	PC Software	Settings match	Notes
Analyst (all)	Analyst Director	Analyzer type and Com port	9600 Baud only
Cellmate (all)	Analyst Director	Analyzer type and Com port	9600 Baud only
VIA or CIA	VIA Director	Analyzer type and Com port	9600 Baud only
Bravo (all)	Bravo PC Vision	Baud, Com port. Select Bravo or Bravo II	Auto searches ports and baud
20/20 TDR	TDR PC Vision	Baud, Com port	Auto searches ports and baud

### Appendix B: HyperTerminal Test/Result Table

Action	Result	Conclusion	Remedy
Start HyperTerminal	Another program...	Another program has this port tied up.	Close other program
Start HyperTerminal	Success	Port available	-
Type in command	Single garbage char per input char	Cable unplugged from unit. Internal cable broken. COM port OK	Plug in or repair cable
Type in command	Success	Cable OK, Unit OK, COM port OK	Configure AEA Software
Type in command	No Response	Possible bad cable or unit unable to respond to command	Check cable. Be sure unit is sweeping (neither exam nor CW mode)