TELEDYNE
INSTRUMENTS
Advanced Pollution Instrumentation
A Teledyne Technologies Company
9480 Carroll Park Drive, San Diego, CA 92121-5201
Phone (858) 657-9800 Fax: (858) 657-9818 Toll Free 1800 324-5190
E-mail: api-customerservice@teledyne.com http://www.teledyne-api.com

Service Note

98-022 Rev B
2 May, 2007

USING RS232 AND MULTIDROP

I. SCOPE:

This service note is designed to give additional information and assistance in establishing basic RS232 communication with API instruments. Service note 95-001 still applies to all analyzers regarding communication through the RS232 port without multidrop.

II. TOOLS REQUIRED:

API analyzer
CPU or other RS232 device (terminal, computer, etc.)
Communications software (ProComm, Crosstalk, etc.)
Interface cable

III. DESCRIPTION:

With the development of the "A" style analyzers, we have striven to simplify the RS232 comunications. RS232 is necessarily complex and with the addition of multidrop, the complexity is increased.

IV. NOTES:

When in multidrop mode:

The analyzers are always in "quiet mode"
The analyzers are always in the "no echo back mode"

You can add only one non-API device (i.e. DANI TNMH 451) on to the communication "chain." This device must follow the "API protocol." The device must also be the last unit in the "daisy chain."

The DANI TNMH 451 will not have an identification number as the API units will. This is possible because the communication commands for the API units are different than the DANI unit, therefore, the APU units will not "answer" any of the DANI commands and likewise the DANI units will not "answer" any of the API commands.

Within the procedure, the term "CPU" refers to the computer/terminal/IBM and the term "analyzer" refers to the CPU board in the analyzer.

V. PROCEDURE:

1. Look at the rear of the unit and ensure that the red LED is illuminated. If it is not, check the analyzer rear panel/internal communication cable and

the analyzer CPU assembly. If you still have problems with this, contact API.

2. Attach the RS232 cable from the CPU to the rear panel of the analyzer. The green LED on the rear panel should come on. If the LED does not come on, change the switch on the rear panel. The green LED should come on now.
3. Set the baud rate on the analyzer and CPU to the same baud rate. This is in the "COMM" menu.
4. On the CPU, type "T LIST" and enter.
5. A complete list of the test functions and their values should appear.
6. If they do not appear, check the cable to ensure it matches the attached notes. Double-check the baud rates of the two devices.
7. When you have the first analyzer communicating to the CPU, unplug the analyzer and do the same procedure for all of the analyzer to be hooked into the "daisy chain."
8. When you have all of the analyzers communicating, connect a multidrop box to the first analyzer.
   A. The two-pin cable from the analyzer to the two-pin connector on the multidrop box
   B. The ribbon cable on the multidrop box to the analyzer
   C. The RS232 cable to one of the DB9 connectors on the multidrop box. (Both DB9 connectors are wired in parallel so it does not matter which connector you plug into).
9. Set the "term/hi-z" switch to hi-z for all the multidrop boxes.
10. In the vars, set the RS232_MODE to:
    100/200 = 35
    All other inst. = 43
11. Type "T 100 LIST" and enter.
12. If the same list does not appear, switch the DCE/DTE switch on the multidrop box to the other position. **NOTE:** All of the DCE/DTE switches on all of the multidrop boxes should be in the same position, DCE or DTE).
13. Type "T 100 LIST" and enter.
14. The same list should appear.
15. Test all of the instruments this way and ensure that they all "talk" to the CPU via the RS232 with the multidrop box installed.
16. You are now ready to connect all multidrop boxes together.
17. In the "COMM" menu, give the instrument an I.D. number. (An easy numbering method would be to set the SO2 unit to 100, the NOx unit to 200, the co unit to 300, the ozone unit to 400 and the calibrator unit to 700).
18. Connect the CPU to one of the multidrop boxes and attach the DB9 cables from one multidrop box to the next multidrop box and so on until all of the multidrop boxes are attached to the "chain".
19. On the last multidrop box, pleace the term/hi-z switches to the "term" position. All of the rest of the multidrop boxes should be in the hi-z position.

20. Type "T 0100 LIST". The SO2 analyzer should give you the list of test functions.

21. Type "T 0200 LIST". The NOx analyzer should give you the list of test functions.
22. Test all of the analyzers to ensure that they all work correctly.