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

98-030 Rev B
2 May, 2007

USING MULTIDR0P WITH API ANALYZERS

I. TOOLS REQUIRED:

API analyzer
CPU or other RS232 device (terminal, computer, etc)
Communication software (HyperTerminal, APICOM, ProComm, etc)
Interface cables

II. DESCRIPTION:

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

III. NOTES:

A. When in multidrop mode:
   1. The analyzers are always in the "quiet mode". This means that you will not be getting your average output, DAS output, or any warning messages.
   2. The analyzers are always in the "no echo back mode". This means that you will not get characters echoed back onto the computer screen when you are typing. You must make sure that when you are typing that you do not misspell your commands.

B. 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" and must be the last unit in the "daisy chain".

C. 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 API units will not "answer" any of the Dani commands and likewise the Dani units will not "answer" any of the API commands.

D. Within this procedure the term "CPU" refers to the

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

IV. PROCEDURE:

Establishing communication:

A. Look at the rear of the unit and ensure that the red LED is illuminated. If the red LED is not illuminated, check the analyzer rear panel/internal communication cable and analyzer CPU assy. If you still have problems with this, contact API.
B. 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. If your analyzer does not have a switch on the rear panel you should have a set of jumpers on the rear panel on the inside of the analyzer. Change the position of the jumpers from horizontal to vertical or vice versa.
C. Set the baud rate on the analyzer and CPU to the same baud rate. This is in the "Comm" menu.
D. On the CPU type "T LIST" and enter.
E. A complete list of the test functions and their values should appear.
F. If they do not appear, check the cable to ensure it matches the attached notes. Double-check the baud rates of the two devices.
G. When you have the first analyzer communicating to the CPU, unplug the analyzer and do the same procedure for all of the analyzers to be hooked into the "daisy chain".

Connecting multidrop boxes:

H. When you have all of the analyzers communicating, connect a multidrop box to the first analyzer.
   1. The two-pin cable from the analyzer to the two-pin connector on the multidrop box.
   2. The ribbon cable on the multidrop box to the analyzer.
   3. 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.)
I. Set the "term/hi-z" switch to hi-z, for all of the multidrop boxes.
J. In the vars set the RS232_MODE to:
   1. 100/200 = 35
   2. all other inst. = 43

K. Type "T LIST" and enter.
L. 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 multi drop boxes should be in the same position DCE or DTE).
M. Type "T LIST" and enter.

N. The same list should appear.
O. Test all of the instruments individually in this way and ensure that they all "talk" to the CPU via the RS232 with the multidrop box installed.

Connecting the analyzers:

P. You are now ready to connect all multidrop boxes together.
Q. 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.)
R. 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".
S. On the last multidrop box, place the term/hi-z switches to the "term" position. All of the rest of the multidrop boxes should be in the hi-z position.
T. Type "T 0100 LIST". The SO2 analyzer should give you the list of test functions.
U. Type "T 0200 LIST". The NOx analyzer should give you the list of test functions.
V. Test all of the analyzers to ensure that they all work correctly.

Should you have any questions about this or any API analyzer, please contact an API Customer Service Representative.

Phone: (619) 657-9800 Fax: (619) 657-9816
Email: customerservice@advpol.com WEB: http://www.advpol.com

SLIDE SWITCHES

SETS THE CONFIGURATION OF THE ANALYZER MULTI-DROP CONNECTORS AS SEEN BY THE HOST SYSTEM.

TERM/HI-Z

TERM = 5K OHM
ONLY ONE ADAPTOR SHOULD BE SET TO THIS POSITION IN THE NETWORK USUALLY THE LAST UNIT.

HI-Z = 300K OHM
DEFAULT POSITION FOR ALL BUT THE LAST ADAPTOR.

DTE/DCE

DTE = DATA TERMINAL EQUIP.
SELECT IF HOST SYSTEM IS DCE.

DCE = DATA CIRCUIT-TERMINATION EQUIP.
SELECT IF HOST SYSTEM IS DTE.
USUALLY THIS IS THE DEFAULT POSITION.