

Optichrom Advance® Application Personal Computer APC 8.0 & 8.1

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Overview

APC 8.0 and 8.1 are provided by Bischoff Analysentechnik GmbH as an interface to the Optichrom Advance ® Gas Chromatograph using a Windows PC. Connections are made between the PC and the chromatograph's Advance Data Hiway using one of these methods:

1. Serial messages to a PC Interface Board (PCI) that transmits messages via the Advance Data Hiway.
2. Ethernet messages forwarded through an Ethernet or via a DataNET gateway to Advance Data Hiway.

The application is written in Visual Basic 6.0, except for those programs that were taken from APC 7.0. The following APC 7.0 files are used: Editor.exe, Chrom.exe, Adblist.exe, Adbmake.exe.

APC Hardware Installation

If using method 1 requiring the PCI board it can be installed in either an Advance Input/Output Unit (I/O), or in the Advance Analyzer Electronic Enclosure. If you purchased the desktop Data Hiway Interface Enclosure (DHIE) that contains the PCI board; refer to page 7 for its installation instructions.

Addressing the PCI Board

Since the PCI board communicates over the Data Hiway it must first be strapped (addressed) for the correct loop and unit numbers. You select an address for the PCI as you would for any Data Hiway device.

To learn "What is a System Address" and "How to Select an Address for Hiway Devices" refer to the Optichrom Advance Board Installation & Strapping Manual (2000524-001).

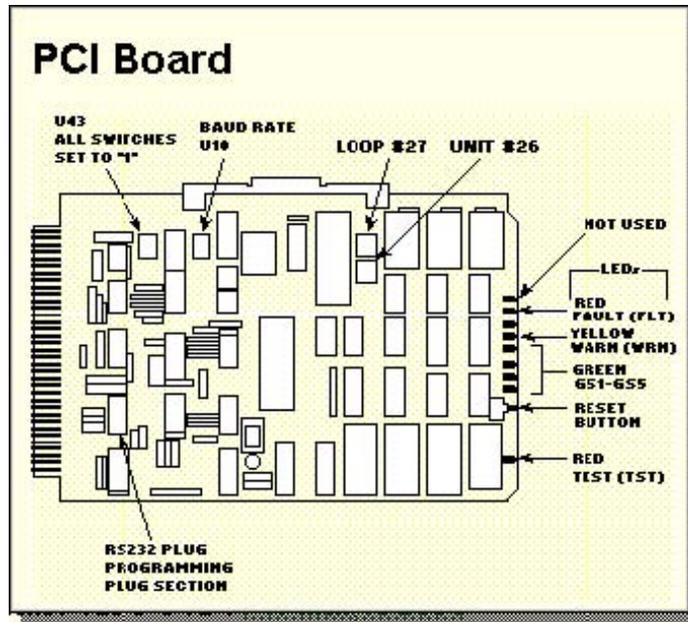


Figure 1. PCI Interface Board (PCI)

1. On PCI locate DIP switches U26 and U27. See Figure 1.
2. Using a pencil or your finger, set DIP switch U27 for the loop number, and switch U26 for the unit number. The strapping method is a binary entry of the number selected.

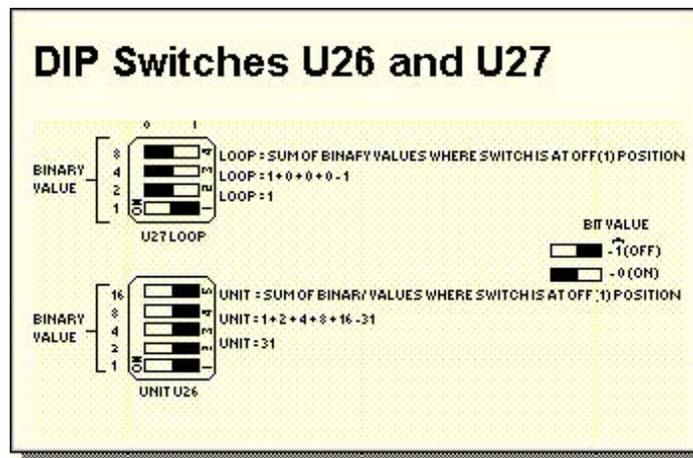


Figure 2. Dip Switches U26 and U27

3. Locate DIP switch U10. See Figure 1. Set DIP switch U10 for the correct baud rate for the RS-232C serial port. The baud rate must be set to match that of the Personal Computer being attached to the PCI. The minimum accepted baud rate is 4800 baud; the maximum is 9600 baud (preset factory baud).

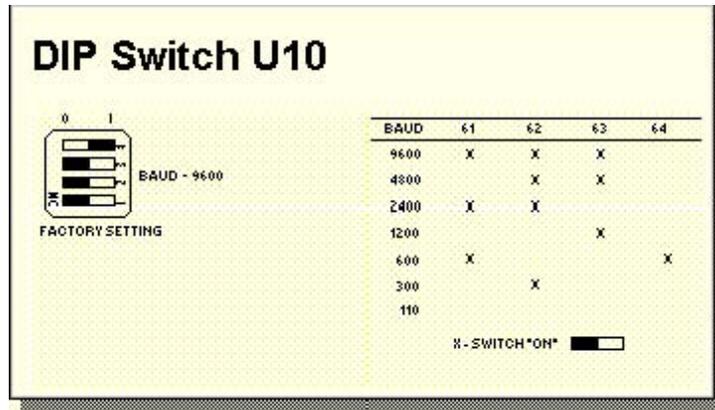


Figure 3. Dip Switch U10

4. Verify that a RS232 programming plug is inserted into the U2 socket. The plug selects the RS-232C output. See Figure 1. If the plug is in U1, remove it and insert it in U2. When inserting match pin 1 of the plug to pin 1 of the socket.
5. Locate DIP switch U43 and verify that all U43 DIP switches are set to the off (i.e. the "1") position.

PCI Installation Instructions

The PCI board can be installed in either an Advance Input/Output Unit (I/O), or in the Advance Analyzer Electronic Enclosure. If you purchased the desktop Data Hiway Interface Enclosure (DHIE) it contains the PCI board; refer to page 7 for the DHIE installation instructions.

Warning



Disconnect all voltage to the equipment before installing the PC Interface Board

Board Installation Instructions

For the following procedures reference the applicable sections of the SAA Optichrom Advance Library Set Volume 1, Installation Manuals

1. Set the equipment power (Mains) switch(s) to off before installing the PCI board.
2. If installation is in the I/O Unit go to step 3. If installation is in the Analyzer Enclosure go to Step 4.
3. Select a vacant board slot in the I/O unit (remember slot 1 is reserved for the I/O Interface Board). Remove the board guide attached to the top edge of the PCI. Push the board securely into the connector.
4. Select a vacant board slot in the Analyzer Electronic Enclosure. Push the board securely into the connector.

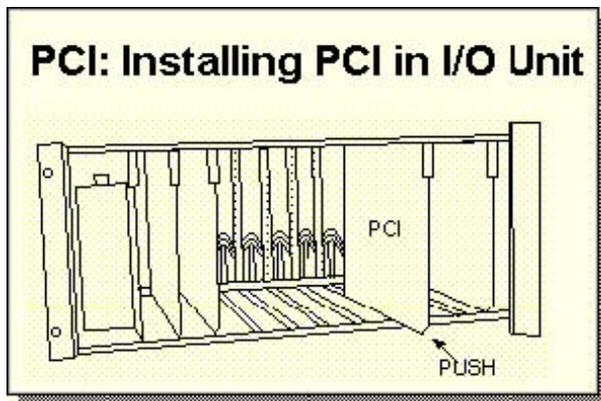


Figure 4. Installing PCI in I/O Unit

Wiring Instructions

If you are using a slot in the Analyzer or I/O unit that was previously used for a Data Hiway device, the connection between the field terminals and the Data Hiway should already be in place however; verify the wiring is in accordance with Figures 6 or 7 and add or modify wiring as required before making connections to PCI.

PCI in Analyzer Wiring Instructions

1. Locate terminal strip T5 on the right edge of the ATB board.

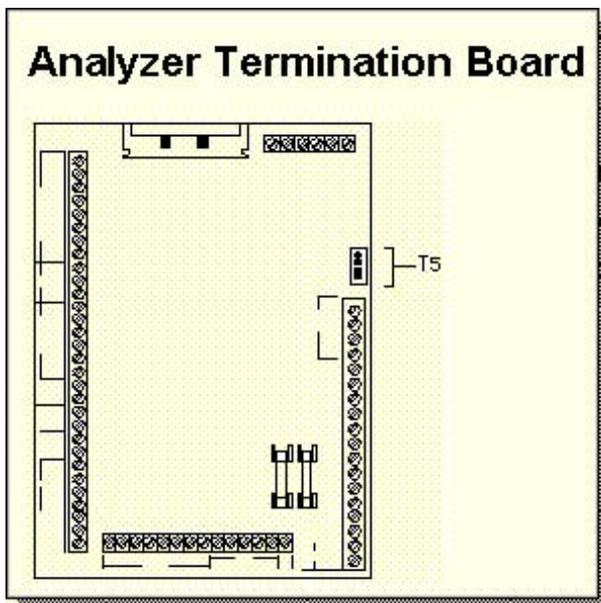


Figure 5. Analyzer Termination Board

2. Referring to Figure 6. Field Wiring Connections in Electronics Enclosure, wire the jumper connections from T5 to the PCI slot, field-wiring terminals 1 through 6. Route these wires away from nearby power wires. You must use 22 AWG or larger wire for the jumper connections,

3. Route the RS-232 interface cable through a top or side knockout hole in the Analyzer.
4. Observing the correct color code, connect the RS-232 interface cable to PCI slot, field-wiring terminals 12 through 18.
5. Attach the connector end of the interface cable to the serial port connector on the back of your PC. Remember, the maximum cable distance for the RS-232 cable between the computer and the PCI is 50 feet.

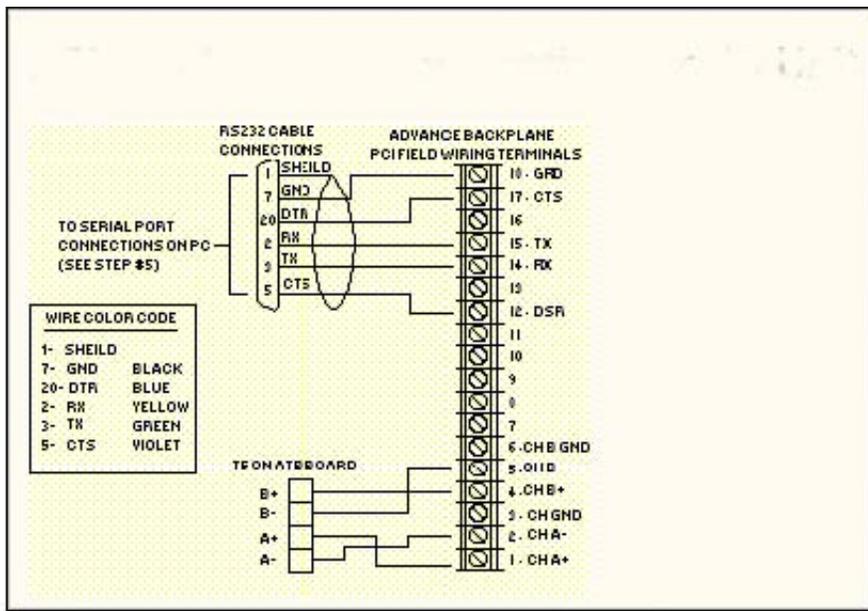


Figure 6. PCI Field Wiring Connection in Electronic Enclosure

PCI in I/O Unit Wiring Instructions

1. Locate the terminal strip associated with slot 1 on the rear of the I/O chassis. Slot 1 houses the I/O Unit Interface Board (IOUI). Referring to Figure 7 wire the Data Hiway jumper connections from slot 1 terminals 1 thru 6, to the PCI field wiring terminals 1 through 6. You must use 22 AWG or larger wire for the jumper connections.
2. Refer to wiring diagram below; observing the correct color code, connect the RS-232 interface cable to PCI slot, field-wiring terminals 12 through 18.
3. Attach the other end of the interface cable to the serial port connector on the back of the PC. The maximum cable distance for the RS-232 cable between the computer and the PCI board is 50 feet.

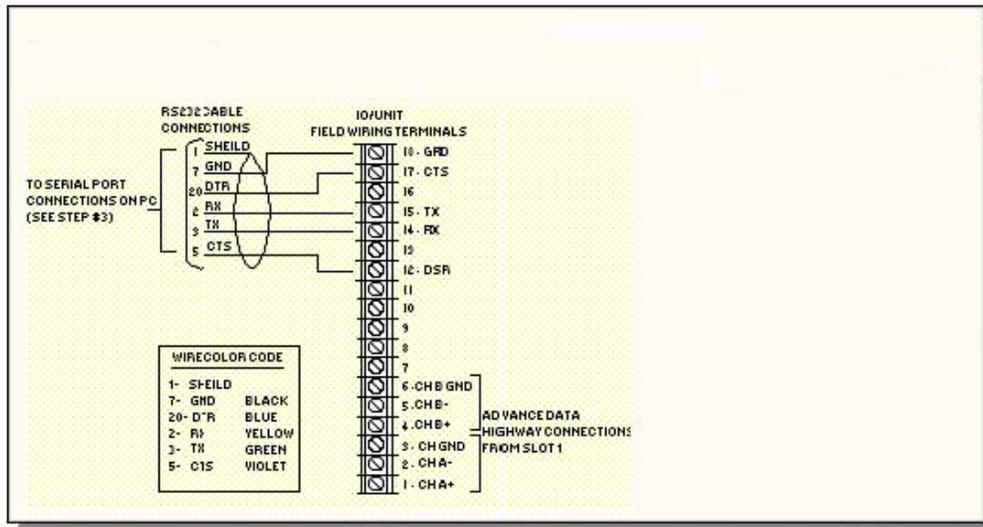


Figure 7. PCI Field Wiring Connections for I/O Unit

Data Hiway Interface Enclosure Unit Installation Instructions

This section provides installation instructions for the desktop Data Hiway Interface Enclosure (DHIE) unit. The DHIE contains a PCI board and associated power supply.

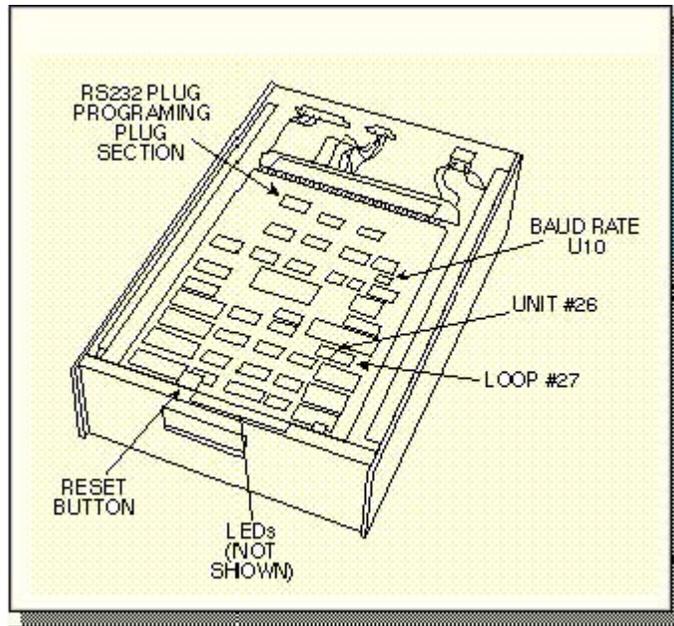


Figure 8. Data Hiway Interface Enclosure

1. Remove the top cover of the unit by first removing the 3 retaining screws that secure it to the chassis and then slide the cover off the unit.
2. Since the PCI board communicates over the Data Hiway it must first be strapped (addressed) for the correct loop and unit numbers. Refer to page 1, "Addressing the PCI Board," and perform steps 1

through 6.

3. Replace the DHIE's cover removed in step 1.

4. For new installations skip step 5.

5. If the analyzer was connected to a Data Hiway use the connection that was to the old APCI and connect to DHIE J2.

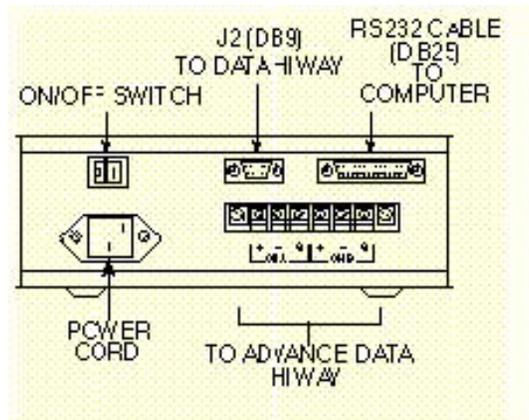


Figure 9. DHIE Wiring Connections

6. For new installations, refer to Volume 1. Installation Manuals "Data Hiway Installation and Termination" manual for installation information. New installation connections are made to terminal strip on the rear of DHIE; see Figures 9 and 10. Attach the Data Hiway cables to the appropriate channels. **Only** ground the shields of each cable at one end.

7. Plug a power cord from DHIE power connector to a VAC Mains (110-230 VAC, 47-63 Hz). Place on/off switch to ON.

8. Observe the LED's on the DHIE front panel. The LED's should flash 'on' for approximately 1 second then turn off.

9. If none of the red LED's remains on after 30 seconds the unit is operational and the installation complete. If any LED remains on, refer to PCI Board Testing and Troubleshooting steps on page 10.

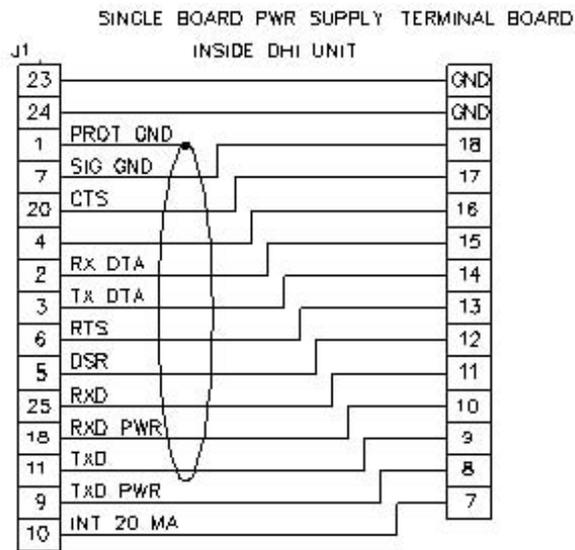
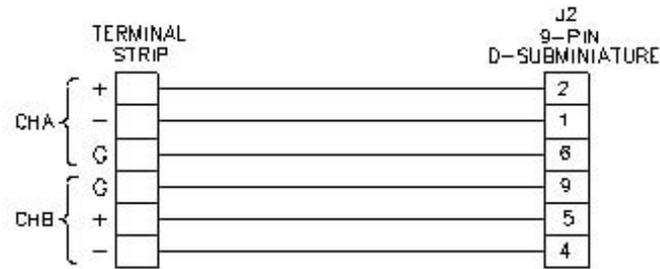


Figure 10. DHIE Connector and Terminal Board Wiring Diagram

PCI Board Testing

1. Set the equipment power switch to ON.
2. Observe the LEDs on the PCI; see Figure 8. The eight center LEDs should all flash "on" for approximately 1 second then go off.
3. If the red LEDs remain off for 30 seconds the board is operational and the installation is complete.

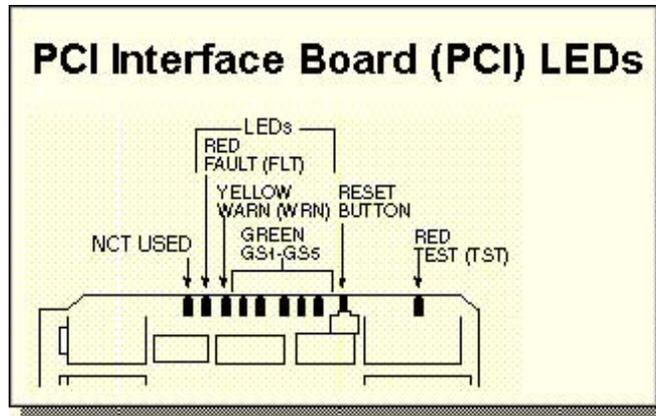


Figure 10. PCI Interface Board (PCI) LEDs

Troubleshooting

If a red fault LED (FLT) remains on after the self-test sequence, and a yellow warn LED (WRN) continues to blink, then the board has not been installed properly, or the board is defective. The number of blinks indicates the type of error. After the warn LED blinks the error code, it will stay off about five seconds before repeating the sequence, Examples 1, 2 and 3.

Example 1

If the RS-232 plug was not aligned correctly when inserted in U1 or incorrectly installed in U2, the red test LED (TST) will remain on after the operational test.

Example 2

If the red fault LED (FLT) is "ON" and the yellow warn LED (WRN) blinks, then the number of blinks of the warn LED indicates the error as follows:

No. Of Blinks	Type of Error	Corrective Action
1	RAM failure.	Replace board.
2	PROM checksum error.	Replace board.
3	Not used	
4	Not used	
5	VIA test failure.	Replace board.
6	Not used	
7	Invalid loop number.	Change loop number
8	Duplicate loop number.	Change loop number
9	Invalid unit number	Change unit number
10	Duplicate unit number	Change unit number
11	Not used	
12	Not used	
13	Backplane access failure	Replace board
14	Not used	
15	Bad jump address	Replace board
16	Stack overflow	Replace board
17	Bad message address	Replace board

Example 3

If the red fault LED (FLT) is “OFF” and the yellow warn LED (WRN) blinks on a continuing basis, then the number of blinks of the yellow warns LED indicates the error as follows:

No. Of Blinks	Type of Error	Corrective Action
1	No access to Channel A.	Check for short on Channel A, or replace board.
2	No access to Channel B.	Check for short on Channel B, or replace board.
3	No access to BOTH Channels.	Check for short on Channel A and Channel B or replace board.

Software Installation

APC 8.1 can be installed in any directory. Additional support directories are created, as needed at program run time, in particular the directories for apc\adb, apc\datalog, and apc\grams.

Requirements

APC 8.1 runs on any of the following operating systems:

Windows 95

Windows 98/NT

Windows 2000 Operating System

- Required for the serial interface: A COM port with its own interrupt attached to an SAA PCI card Version 1.4 or above.
- Required for the Ethernet interface: An Ethernet or DataNET gateway on Advance Data Hiway and Ethernet connections from the APC workstation.

Configuring Communications

The first time the program runs, it will have to be configured for the type of communications. The radio button marked Use PCI should be pressed for the serial interface and the button marked Use TCP/IP should be pressed for the Ethernet interface. Only one type can be active at a time, but they can be switched at any time.

When selecting Use PCI, the baud rate and COM ports must be set. The Test Port button can be pressed to establish messaging between the APC and the PCI. After a few seconds there should be a green area indicating the PCI version and loop and unit number. If there is a problem with the link, after about 5 seconds the area will turn red and indicate a problem with suggestions. Make adjustments and retest. Make sure the windows driver for the COM port is installed control panel/ system / device manager /

ports (COM and LPT) port is NOT Xed off. Also make sure the aadriver.exe does not install in the autoexec.bat file on the COM port you want to use.

When selecting Use TCP/IP, the only settings necessary are the loop and unit. This will give the APC a loop and unit to communicate on Advance Data Hiway. To change the loop and unit, make entries in the text boxes and press Test Loop/Unit. This will cause the gateway to broadcast the APC's loop/unit identity on Advance Data Hiway.

Once communication has been established, save them for subsequent sessions using Settings and select Save Settings. This will put the settings in a file apcsettings.ini in the path apc\sys. When the program starts it will read the communications settings and initialize communication.

Selecting Chromatogram Display Program

Under the Settings menu option, select the Chromy99 program for chromatogram display if desired. If it is not selected, the Chrom display program from APC 7.0 will be used. Save Settings to save your selection. You can change this at any time.

Configuring Analyzers

APC 8.1 allows a copy of an analyzer list to be kept and loaded when the program runs. Go to file, Analyzer List to view the list. You may enter units with the Add button, or go back to the Menu option Tools then select Highway Devices. Select Tools and poll the desired loops. When you return to the analyzer list, the analyzers will be present. Press Save to save the analyzer list in the apcstuff.ini file, which will load when the APC runs. If you don't want to do the above, wait 10 minutes for all the analyzers to transmit their unit ids to the Data Hiway.

Use Edit to change settings on an existing selected analyzer, Add to add a new analyzer to the list, Delete to remove a selected analyzer from the list. The list gets refreshed over time by the powered up analyzers on the highway.

Features

Data Logger

Data Logging

The data logger is always active as long as the APC 8.1 is running whether or not the data logger window is displayed. If the data logger window has been closed then it may appear blank until the next data log comes in at which time it will show the log of all of the previous logs since APC 8.1 was started. If the data logger window is minimized it will always show the updated information.

The Data Logger windows defaults to 24 lines but it can be adjusted up to 50 lines by selecting the menu item Display Attributes.

The program should be able to deal with up to 6 analyzers all wanting to data log at same

time. If a 7th wants to start a log before the first one is through the 7th will be ignored and the data lost. Each analyzer gets 10 seconds to send the next line of data. If it does not get the next line out in time, the program will prompt the analyzer again. If the analyzer fails on the second prompt, the program assumes a failure, writes an error message and goes on to the next analyzer in the queue if any. An analyzer can send as many lines as it wants as long as it takes no more than 20 seconds between lines.

Data logging is considered the highest priority of data. In order to minimize the chance of lost data, service panel emulation response will slow and real time chromatogram will go to fast plot when APC 8.1 is logging data from an analyzer

Data Log Printing

Windows assumes all prints are closed ended so it stores everything in a buffer until it reaches the end of the print job. In order to release information in the print buffer, the program either has to close or one has to go to File, Purge printer, or use the new command <E> in the analyzer logging event. Another choice would be to put the information in a file, then use the "<O filename>" command to print the file to a printer.

Printer can be any printer including network printers. Printer does not have to be directly attached to the APC if the APC is on a network.

If one knows the maximum number of lines on the printer, one can keep track of the number of lines printed in a buffer, then evoke <E> when the maximum number of lines are reached. For example, if B (29) keeps track of the number of lines and 60 is the maximum number of lines then:

```
100 IF B (29) < 60 THEN 200
100 PRINT "<E>"
100 LET B (29) = 0

      200 LET B (29) = B (29)+1
```

Data Logger Command Summary

Command Description

<F filename> Save to file "filename"

<S> Send to screen

<P> Send to printer

<B filename> Send to screen and save to file "filename"

<L filename> Send to Printer and save to file "filename"

<D> Send to screen and printer

<A filename> Send to screen and printer and save to file "filename"

<C filename1 filename2> Copy "filename1" to "filename2" or

<C filename1,filename2> Copy "filename1" to "filename2" (NEW)

<C file1 + file2 file3> Copy file1 and file2 to file3 (file concatenation)

<X filename> Delete file "filename"

<O filename> Copy "filename" to printer

<W program> Start "program" in a separate window (NEW)

<E> Eject page from printer (purge printer) (NEW)

<J filename> Backup filename in case of error is "filename" (NEW)

"=NEW" If found as suffix to any filename, will delete existing filename with that name, then

start saving to it so that from that point on data file data is new. Conforms to SAA APC 7.0 convention. Effectively the same as doing an "<X filename>" followed by any command that saves to a file.

NEW Data Log Types (Not in APC 7.0)

<E> will force printout of data in printer queue and do a form feed.

<W filename> will open a window and execute the file "filename". Example "PRINT <W notepad.exe>" will open the program Notepad in another window on the APC. This new program will then run independently of APC 8.1. This can be used to start another program to take action on the now saved data such as Microsoft Access or Excel. New program should be completed and exit before the statement executes again or APC 8.1 will try to open a second instance of the same program.

<J filename> which will change the backup filename and path from "apc\datalog\backupdata.txt" to any valid Windows path. This feature is intended for use when data logging is done to network drives that may be down. If the network or network drive is down then the data can be saved to a local drive (e.g. "C:" drive) for moving later. The backup storage location should be a local drive on the PC.

File commands

For file commands, the F,L,B,D,A,C,X,O and J data log commands, the default path is apc\datalog which can be overridden with the use of a path in the filename. Filenames can be anything that conforms to Windows rules like longer than 8 characters and imbedded spaces.

Copy command. APC 7.0 treats the space as a delimiter between the two files names in the <C filename1 filename2> command. If APC 8.1 finds a comma in the line for the C command it will use the first comma as the delimiter between the two file names otherwise it will use the first space it finds as the delimiter between file names in order to be compatible with APC 7.0. Example: PRINT "<C garbage and junk.txt, stuff it.txt>" will copy "c:\apc\datalog\garbage and junk.txt" to the file "c:\apc\datalog\stuff it.txt", but PRINT "<C garbage and junk.txt stuff it.txt>" will try to copy "c:\apc\datalog\garbage" to the file "c:\apc\datalog\and junk.txt stuff it.txt".

Service Panel Emulation

Maintenance Mode

Service Panel Emulation - Maintenance mode is intended to work just like the APC 7.0 version. Number keys and Function Keys F1 to F10 work identically to APC 7.0. Where the Alt key was used in APC 7.0 to access the second set of actions for a key, APC 8.1 selects that action by merely clicking on the text above the button.

Use ALT-F7 (same as APC 7.0) or F11 to save the analyzer databases (*.adb files) for all analyzers in the list. It saves files to apc\adb\ANLZ###.adb where ### is the analyzer number 1 to 255. The program gives each analyzer 10 seconds to respond to requests to initiate and continue sending data blocks. If an analyzer does not respond within that time period, the program will go on to the next analyzer on list. It starts at the lowest analyzer number and works up. ALT-F11 will cancel the save. If a save is already in progress, the save on that analyzer will finish but there will be no further analyzers processed.

All saves automatically verify the new file. If the file is bad, it gives the user the opportunity to trash the new file before it replaces the old file. If the new analyzer table file is saved with

*.adb extension, the previous file with the same name is given *.bak extension.

An alarm on an analyzer shows up as a red box to the right of the lower display window.

Application Mode

Service Panel Emulation - Application mode works somewhat differently than APC 7.0. There are no letter keys on the display window because they are replaced with keyboard input. Unused keys are not shown. Keys F1 to F11 and ALT-F7 has similar functions as in the maintenance mode. Where the Alt key was used in APC 7.0 to access the second set of actions for a key, APC 8.1 selects that action by merely clicking on the text above the button.

When a modifiable table is selected, it is displayed in a text box that can contain up to about 70 chars. Use the keyboard and mouse to edit the text box to the desired change then press the enter key on the window or F6 or Enter key on the keyboard.

The blue number keys can only be used to select the right table or analyzer. They won't put number characters in the text box. The arrow keys will work for single space movement, if repeat action is desired, use the arrow keys on the keyboard.

Table Editor

The Table Editor program is the APC 7.0 version. See its help for information.

File Make and List

These functions, which are run from the Tools Menu option, use the programs adblst.exe and adbmke.exe. The Edit ADL function uses the selected editor: edit.com, notepad.exe, or any other editor of choice. Set the editor under the Menu option Editor. The ADB to ADL function converts an uploaded .adb file into an editable .adl file. ADL to new remakes an .adb file with the extension .new.

The editor versions also rename the headers in the adblst output file (*.adl) and adbmke output file (*.new) to that of the name of the original file to be converted is used rather than the temporary name. The names are truncated to 25 characters in adblst and 24 characters in adbmke. Note also that if using Edit.com as the editor, full Windows file names are not permitted (e.g. no spaces in file names)

Saved Chromatogram Display

Chromatograms are saved from the Load Program button on the Service Panel. Once it is saved, the APC has two choices for chromatogram display: The APC 7.0 chromatogram display program, or the chromy99.exe shareware program. These can be set and saved under the Menu Settings option. Both of these programs have limitations. There are no plans by Siemens Applied Automation to enhance these programs or fix problems. The recommendation is to use Advance EZChrom, if available.

Real Time Chromatogram Display

Real-Time chromatogram display is selected from the file drop down menu on the service panel maintenance screen. An analyzer must be displayed for it to work. Select the detector under the Change Detector option. Options are available to set the span, attenuation, and update rate. Also available are functions to print and freeze the display.

Debug

Debug is intended only for the programmer's use in debugging the program. It displays the data going back and forth between the PC and the PCI card as well as other parameters. Customer use of this feature is discouraged and no technical support will be available from Siemens Applied Automation.

Unsupported APC 7.0 Functions

MOVEF, and FTIR commands not supported in APC 8.1.
Phone Link capability is not supported.

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