



User's Guide



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OM-HAP & OM-HAP-LITE



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WARNING: These products are not designed for use in, and should not be used for, patient connected applications.

1 What is HAP

1.0 Terminology

HAP - HyperWare™ Automation Program. A proprietary software package for use with the Omega Engineering Inc. OM-320/OMP-MNL/OMP-MODL Family of Data Loggers. This manual describes HAP.

PC - IBM compatible Personal Computer

HyperWare - OM-320/OMP-MNL/OMP-MODL family programming and processing PC based software package. HAP and HyperWare are two separate software packages. An understanding of HyperWare Net Programs is suggested before attempting to use HAP. See Omega Engineering Inc. manuals “Using the OM-320/OMP-MNL/OMP-MODL” or “Using the OM-320/OMP-MNL/OMP-MODL” for HyperWare description.

1.1) HAP Basic Description

The HyperWare Automation Program (HAP) is a powerful software package designed to automate the collection of data, generate reports, or alarm from any telephone modem, RS232, or RF modem linked OM-320/OMP-MNL/OMP-MODL based data loggers. HAP is a Windows 95 or NT based application that can execute in the background while other Windows tasks are processing.

When HAP is executing on an IBM compatible Personal Computer (PC), the PC automatically interrogates remote OM-320/OMP-MNL/OMP-MODL sites and transfers data from the OM-320/OMP-MNL/OMP-MODL to the PC. The downloaded files can be converted into a format that includes Microsoft Excel, Standard Comma Delimited (CSV) file, or HyperPlot format (HLD). Each site is configurable by setting parameters in a site file. Site configuration parameters include interrogation interval, start time, number of interrogations, report options, download memory data options, and communication parameters. The HAP initiated interrogation is useful for periodic updates of an OM-320/OMP-MNL/OMP-MODL system.

An OM-320/OMP-MNL/OMP-MODL may initiate communications with HAP. After the Logger has established a connection with HAP, HAP interrogates the Logger with options selected by the user during the HyperWare Net Program creation. The same options available for a HAP initiated interrogation are available with a OM-320/OMP-MNL/OMP-MODL initiated interrogation. In addition, the OM-320/OMP-MNL/OMP-MODL initiated interrogations provide for an alarm capability, notifying the user of a condition in the Logger system. The OM-320/OMP-MNL/OMP-MODL initiated communications are useful for alarm conditions and conditional logger interrogations.

1.2) Logger Communication Methods

Methods of PC to Logger communications include RS232, PC Modem, and RF Modem. These communication methods are AutoPoll site and AutoAnswer user configurable.

1.3) A few typical scenarios for HAP

1.3.1) Water Quality

Monitor remote location water temperature, pH, dissolved oxygen, conductivity, hydrocarbons, and turbidity. The Logger is powered from batteries and has an RF Modem installed. The Logger is then remote requiring no phone line. If your measurements exceed threshold value the logger automatically notifies you by displaying a popup message on your PC when arriving at the office in the morning.

1.3.2) Irrigation System Monitoring and Control

Irrigation systems commonly combine measurement of meteorological parameters (temperature, relative humidity, wind, etc.) with measurement of water level and flow. Water quality can also be monitored. The datalogger's control capabilities allow it to operate pumps, gates, valves, and even alarms. Watermasters can install networks of dataloggers to monitor entire irrigation districts. Water reports are generated automatically on a weekly basis using HAP Auto-Poll feature. HAP executes in the background and automatically prints the report for each irrigation site. Every week HAP generates a hard copy of the irrigation report for each site.

1.3.3) Utilities and Energy

Monitor and control temperature, duty cycle, on/off status, position, pressure, flow, load, depth, and strain. Automatic reporting using HAP's report feature.

1.3.4) Civil and Structural Engineering

Consultants and governmental agencies use Omega Engineering equipment to monitor conditions such as slope stability, loads, temperatures and other variables on dams, roads, bridges, and building walls. Analyze the data on a daily basis using HAP's automatic report generation with Excel using your calculations and Macros. In addition, set up alarm conditions to automatically notify on your PC.

1.3.5) Geotechnical and Mining

Assess tunnel subsidence and roof sag, wall movement, foundation deformation and settlement, crack and joint displacement, stress (in materials), pore pressure, and slope stability. Monitor mining equipment, gases, stresses, temperatures, and air flows. Use the dataloggers with a PC running HAP to periodically report and notify alarm conditions.

1.3.6) Factory Machine Monitoring

Automatic report of a number of machine cycles and maintenance conditions on a daily basis for the Factory Manager.

2 PC System Configuration and System Requirements

2.1) Software Requirements

- 1) Version 4.0 HyperWare for Microsoft Windows
- 2) Version 4.0 Firmware for OM-320/OMP-MNL/OMP-MODL Family
- 3) HAP for Microsoft Windows

2.2) Data Logger Requirements -

Omega Engineering Inc. OM-320, OM-420, OMP-MNL, or OMP-MODL

2.3) PC Configuration

- 1) IBM Compatible PC with Windows 95, Windows 98, Windows 2000, XP or NT
- 2) Minimum 16 Mbytes RAM
- 3) Free RS232 port, PC modem, or RF modem

2.4) PC Modem Configuration (If using PC modem)

- 1) Hayes Compatible Modem
- 2) The Modem init string must have verbal result codes "ON". If dip switches can be set, verbal result codes are "ON". Most commonly, Hayes compatible init strings include are "Q", "V" and "X". Check your modem manual for the correct commands. By selecting verbal result the modem displays "RING" by using terminal emulation program when the modem is called.
- 3) The Modem must be configured for hardware flow control. Typically, a "F" command.
- 4) The modems dip switch Auto Answer is off. Make sure the Auto Answer feature is off in the HAP Modem init string.

2.5) Excel Requirements (Optional)

The report feature of HAP requires Microsoft Excel be installed on the PC. If you don't use the report capability, Excel is not required. HAP is compatible with **Excel version 5.0 and above.**

3 Software Installation

3.1) Installation Instructions

HAP installation comes with 3 diskettes. Each one of the diskettes contains compressed files. Follow the steps described below to install:

- 1) Insert HAP Installation Disk 1 in the PC 3.5 inch 1.44 Mbytes floppy drive.
- 2) Launch Microsoft Explorer and select the floppy program “setup.exe”. (The alternative is to Start-Run <floppy>:setup.exe.)
- 3) Once setup.exe is executing the Setup Dialog opens:

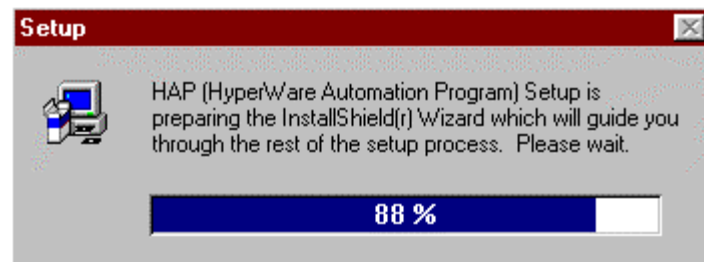


Figure 3.1a Setup Dialog - The first installation dialog

- 4) Upon completion of the Setup Dialog, the Welcome Dialog opens:

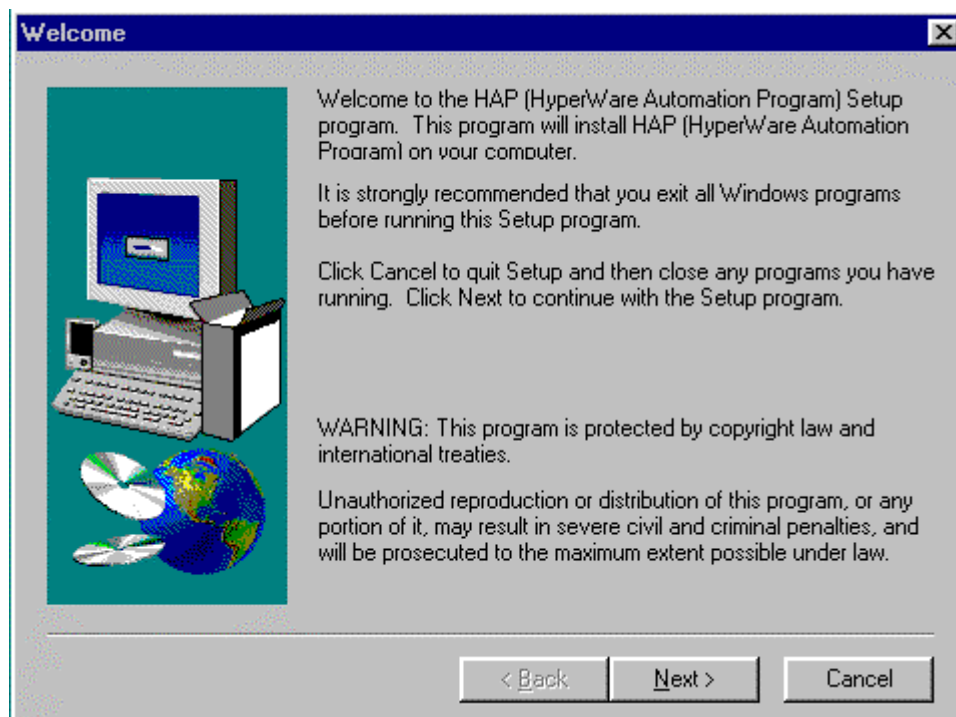


Figure 3.1b Welcome Dialog

Select “Next”

- 5) The “Choose Destination Location Dialog” opens

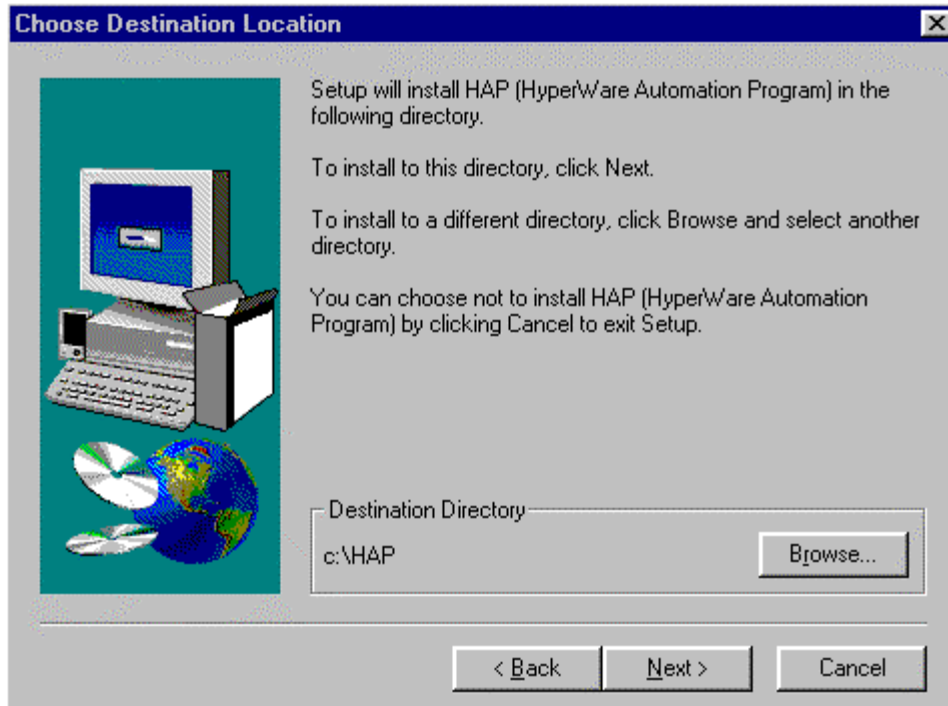


Figure 3.1c Choose Destination Location Dialog

You may select a destination directory or select “Next” to accept the default directory.

Note

You may not execute multiple instances of HAP. Installing a second copy of HAP in second directory makes the first copy of HAP a **non-executable**

6) Copy Files dialog opens and the files necessary to run HAP are copied to the PC.

During the copy file process, the user is prompted for disk 2 and disk 3.

7) If you wish to install any one of the HAP Icon’s on your Window’s Desktop, select the Icon from the HAP Application Window then drag and drop the Icon onto the Desktop.

3.2) Files Installed

The following files are installed:

- 1) <HAP>ap.exe
- 2) <HAP>timer.exe
- 3) <HAP>hapreport.exe
- 4) <HAP>hapregister.exe
- 5) <HAP>HAP.lbi
- 6) <HAP>LBIgeneric.txt
- 7) <HAP>lic.inf
- 8) <HAP>mmnoprt.txt
- 9) <HAP>mmprt.txt
- 10) <HAP>ap.reg

- 11) <HAP>timer.reg
- 12) <HAP>hapreport.reg
- 13) <HAP>ap.hlp
- 14) <HAP>readme.txt
- 15) <WindowSystem>mfco42d.dll , if same date or newer
- 16) <WindowSystem>mfc42d.dll , if same date or newer
- 17) <WindowSystem>msvbvm50.dll , if same date or newer
- 18) <WindowSystem>msvcrt.dll , if same date or newer
- 19) <WindowSystem>olepro32.dll , if same date or newer
- 20) <WindowSystem>oleaut32.dll , if same date or newer
- 21) <WindowSystem>mscomm32.ocx , if same date or newer
- 22) <WindowSystem>comctl32.ocx , if same date or newer
- 23) <WindowSystem>comctl32.dll , if same date or newer, by user
- 24) <WindowSystem>regsvr32.exe , if same date or newer
- 25) <WindowSystem>comdlg32.ocx, if same date or newer

3.3) Files Registered

- 1) ap.reg
- 2) timer.reg
- 3) hapreport.reg
- 4) mfco42d.dll
- 5) olepro32.dll
- 6) oleaut32.dll
- 7) mscomm32.ocx
- 8) comdlg32.ocx
- 9) comctl32.ocx

3.4 Uninstall Instructions

- 1) Select Start - Settings - Control Panel. Select Add/Remove Programs. Select HAP from the Install/Uninstall property page, and select the Add/Remove Button.
- 2.) Delete the <HAP> directory from your computer

4 HAP Usage

4.0 Launching HAP

Select the HAP Desktop Icon illustrated below in figure 4.0a



Figure 4.0a HAP Desktop Icon

Figure 4.0b illustrates HAP's Main Dialog after Launch:

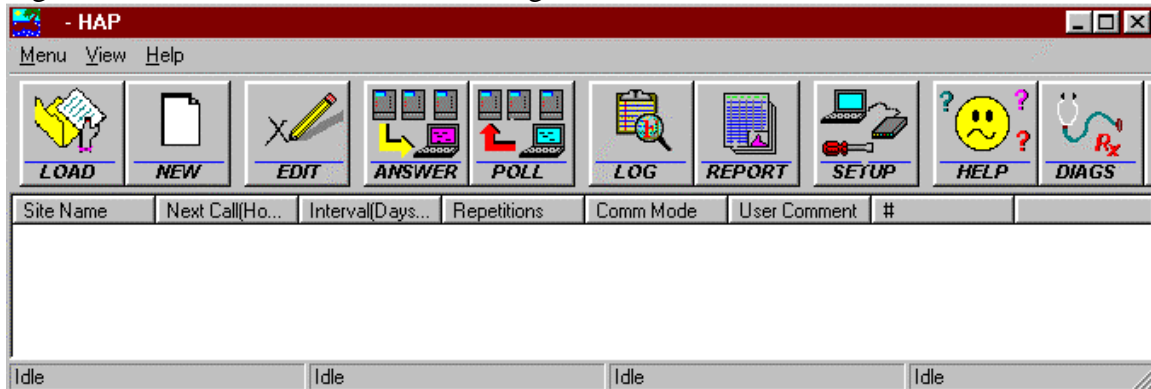


Figure 4.0b HAP's Main Dialog after Launch

4.1 AutoPoll

4.1.1 Overview

AutoPoll is a feature of HAP that provides for PC originated automatic data download and report generation of data acquired with Omega Engineering Data Loggers. The Logger interrogation options include periodic programmable data download, configurable report generation, and multiple site interrogation. AutoPoll executes in the background while other processes are executing on the PC. A rigorous Log File tracks AutoPoll operations as the polling sequence progresses.

4.1.2 Construction of a Site

The HAP dialog to create a site is illustrated below:

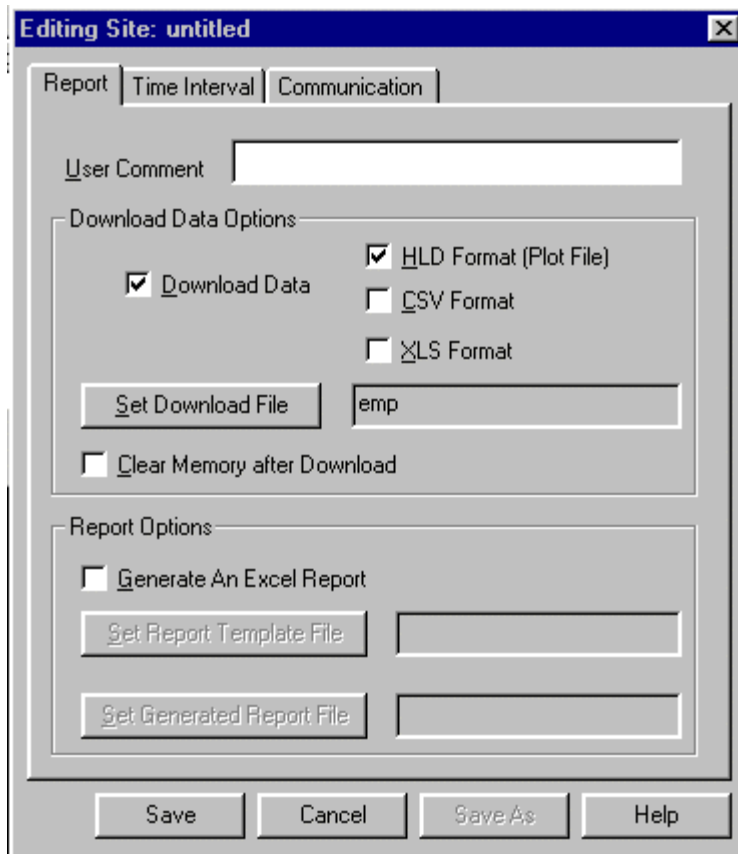


Figure 4.1.1 - Editing Site Dialog

The Editing Site Dialog may be accessed to generate a new site by:

- 1.) Launch HAP program
- 2.) Select “New” from the Main Dialog
- 3.) Select “New Site” from the Edit Polling File Dialog

The Editing Site Dialog is a Windows standard 3 tabbed property sheet. Each tab is selected to access Report, Time Interval, or Communication Parameters.

4.1.2.1 Report Tab

Each Parameter on the Report Tab is defined below:

- 1) User Comment: This is user typed text message that appears in the Log and downloaded Logger files.
- 2) Download Data - Selecting this option provokes a memory data download from the Logger. The format of the downloaded file must be selected; HLD, XLS, or CSV.
- 3.) HLD Format - Selecting this option generates a *.HLD file subsequent to a Logger download. A HLD is an Omega Engineering specific text file containing Logger acquired data. The HLD file is used by the Omega Engineering HyperPlot utility.

4.) CSV Format - Selecting this option generates a *.CSV file subsequent to a Logger download. A CSV is a generic comma delimited text file containing Logger acquired data. 3rd party packages such as Mat Lab or Excel use the CSV file.

5.) XLS Format - Selecting this option generates a *.XLS file subsequent to a Logger download. A XLS is a Microsoft Excel Binary file containing Logger acquired data. Only Microsoft Excel uses this XLS file.

6.) Set Download File - After Selecting this button the standard Windows File Selection Dialog appears:

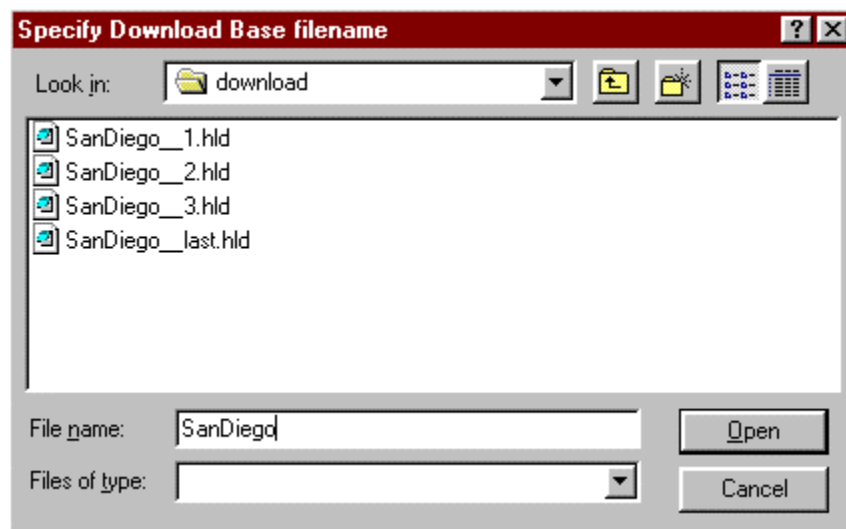


Figure 4.1.2.1a Specify Download base filename Dialog

In Figure 4.1.2.1a above the user has typed in “SanDiego” as a site file name. The 4 files that appear in the file dialog window of previous Logger downloads.

HAP appends on the “__1”, “__2”, “__3”, and “__last” to the SanDiego site filename during the downloaded file generation. Each file “__1”, “__2”, “__3”, and “__last” corresponds to subsequent downloads by HAP from the Data Logger. The most recently downloaded file is “SanDiego__last.hld”.

When the user specifies “SanDiego” as a filename and polling takes place, “SanDiego__last.hld” gets copied to “SanDiego__4.hld”. Therefore the next HLD downloaded file is “SanDiego__last.hld”.

7) Clear Memory after Download - Selecting this option causes HAP to issue a “Clear” Command to the Data Logger after the Data is Downloaded and a report is generated.

8) Generate an Excel Report - This option activates the Excel Report Generator upon timed polling of a site. If this option is selected, the “Set Report Template File” button must be selected for the user to provide a Excel template file name. In addition, the “Set Generated Report File” must be selected for the user to provide an Excel report file name.

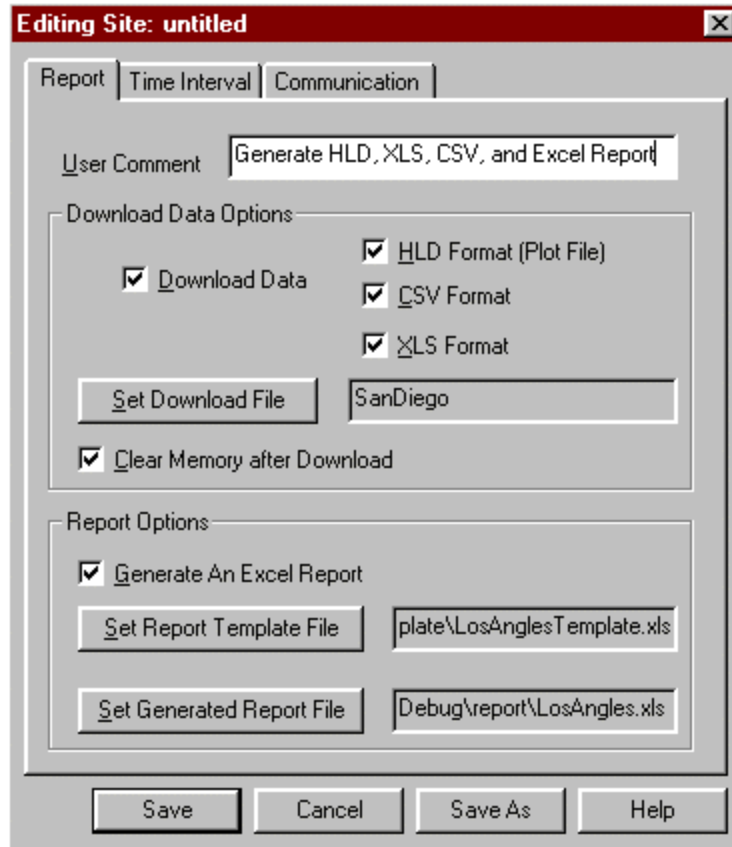


Figure 4.1.2.1b Editing Site Report Tab

Figure 4.1.2.1b illustrates a Editing Site Report Tab with all the options selected.

9) Set Report Template File - This option, “Generate An Excel Report” is selected. Subsequent to selection, the file dialog appears:

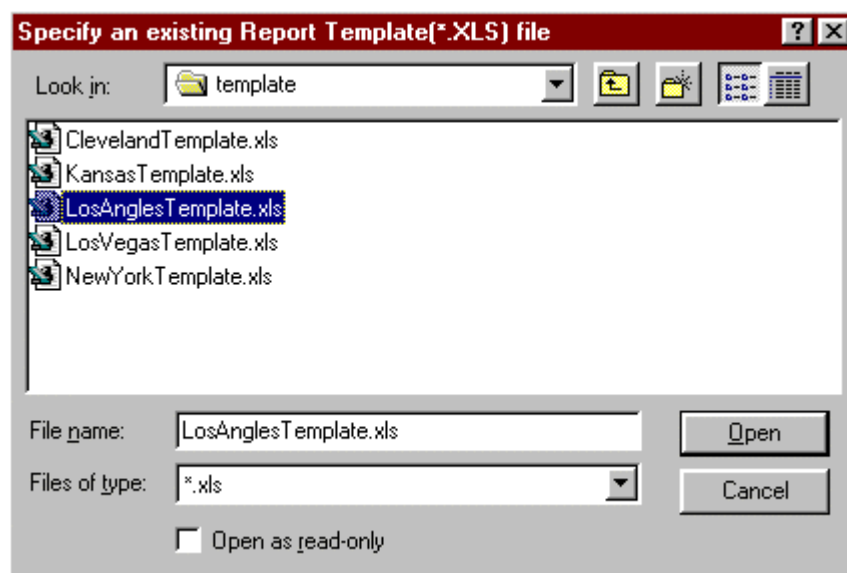


Figure 4.1.2.1c Specify an existing Report Template (*.XLS) file Dialog

Figure 4.1.2.1c above illustrates the user selecting the “LosAnglesTemplate.xls” Excel Template file. The “LosAnglesTemplate.xls” file has been created with the HAP Report Generator, see Section 4.3 for a description of the HAP Report Generator.

9) Set Generate Report File - This option is selected after selecting “Generate An Excel Report”. Subsequent to selection, the file dialog appears:

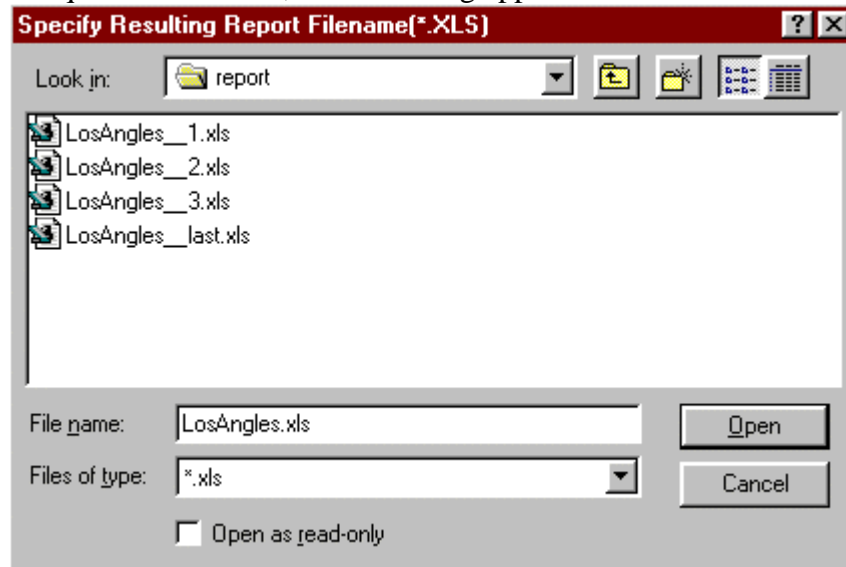


Figure 4.1.2.1d Specify Resulting Report Filename (*.XLS) Dialog

Figure 4.1.2.1d above illustrates the user selecting the “LosAngles.xls” Excel Report file. The 4 files that appear in the file dialog window are previous Logger Reports.

HAP has appended “__1”, “__2”, “__3” and “__last” to the LosAngles report file name during previous report file generation. The most recent report file is always append with a “__last”. “__1”, “__2”, and “__3” are reports generated previous to “__last”.

Prior to generating the next “__last” report, HAP renames the current “__last” file to “__4”. This provides for a backup of all previous reports with the same filename. Therefore, the next HAP report generation does:

- i.) Renames the “LosAngles__last.xls” to “LosAngles__4.xls”.
- ii) Generates a new “LosAngles__last.xls” with the current logger report information.

Warning

Early versions of Microsoft Excel require directory paths and file name prefix less than 8 characters. HAP appends on 6 characters to the report file name. **If you use Microsoft Excel that has a limit of 8 characters in the path and file name, you can not use more that 2 characters in the report file name and no more than 8 characters in any directory path.**

4.1.2.2 Time Interval Tab

Figure 4.1.2.2 below illustrates the Time Interval Tab:

The screenshot shows a dialog box titled "Editing Site: untitled" with three tabs: "Report", "Time Interval", and "Communication". The "Time Interval" tab is active. It contains two main sections: "Start Time" and "Repeat Interval".

The "Start Time" section includes:

- Hour:Minute: 11 AM, 0
- Day: 15
- Month: MAY
- Year: 1,998

The "Repeat Interval" section includes:

- Units: DAYS
- Unit Time: 1
- Number of Reps: 0 (with a note "0=Continuous")

At the bottom of the dialog are four buttons: "Save", "Cancel", "Save As", and "Help".

Figure 4.1.2.2 Time Interval Tab

Each Parameter on the Time Interval Tab is defined below:

- 1) Start Time Hour : Minute - This parameter corresponds to the start time hours and minutes of logger interrogation.
- 2) Start Time Day - The day of the month for starting the logger interrogation.
- 3) Start Time Month - The month for starting the logger interrogation.
- 4) Start Time Year - The year start time.
- 5) Repeat Interval Units - the units of the repeat interval. Options for units correspond to Minutes, Hours, Days, or Weeks.
- 6) Repeat Interval Unit Time - The time associated with the Repeat Interval Units. In Figure 4.1.2.2 - the unit time is "1". This corresponds to a repeat interval of 1 day. HAP polls the logger daily, once a day. If the Repeat Interval is "2", the logger is called every other day.
- 7) Repeat Interval Number of Reps - The number of times the logger is interrogated for the selected interval. In Figure 4.1.2.2 above, "0" is selected indicating continuous

polling. If HAP is in continuous polling mode, only the user can terminate the cycle of polling by turning off polling or exiting HAP.

If Number of Reps is “2” then HAP interrogates the logger two times only. Polling then terminates for that site.

Note
HAP is year 2K compliant.

4.1.2.3 Communications Tab

HAP can be connected to a Logger using RS232, PC modem, or RF modem. Figure 4.1.2.3a below illustrates the Communication Tab for a typical RS232 configuration:

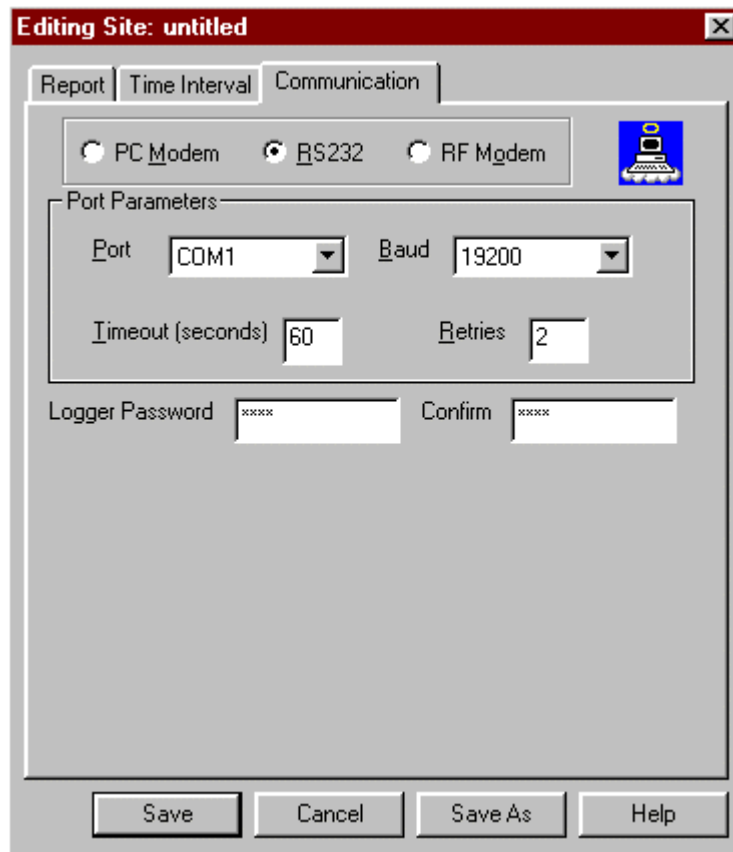


Figure 4.1.2.3a Communication Tab for RS232

Each Parameter on the Communications Tab for RS232 is defined below:

1)Port Parameters Port - The PC’s COM port. The available options include COM1, COM2, COM3, and COM4.

2) Port Parameters Baud Rate - The COM port baud rate. Available options include 1200, 2400, 4800, 4800, 9600, 14400, 19200, 28800, 38400, and 57600.

Note

Omega Engineering Data Loggers have a fixed RS232 baud rate of 19200. PC Modem and RF Modem have selectable baud rates.

3) Port Parameters Timeout - The maximum amount of time allowed to establish and verify communication with the Data Logger. Each attempt to communicate with a Logger has the same “Timeout”.

4) Port Parameter Retries- The number of retry attempts to establish communication with a logger. A retry will attempt communication for a “Timeout” amount of time.

5) Logger Password:- If the Omega Engineering Data Logger has been programmed with a password, AutoPoll requires that password during interrogation.

6) Confirm - A duplicate of the password typed in above. This provides error detection of the password.

Figure 4.1.2.3b below illustrates the Communication Tab for a typical PC Modem configuration:

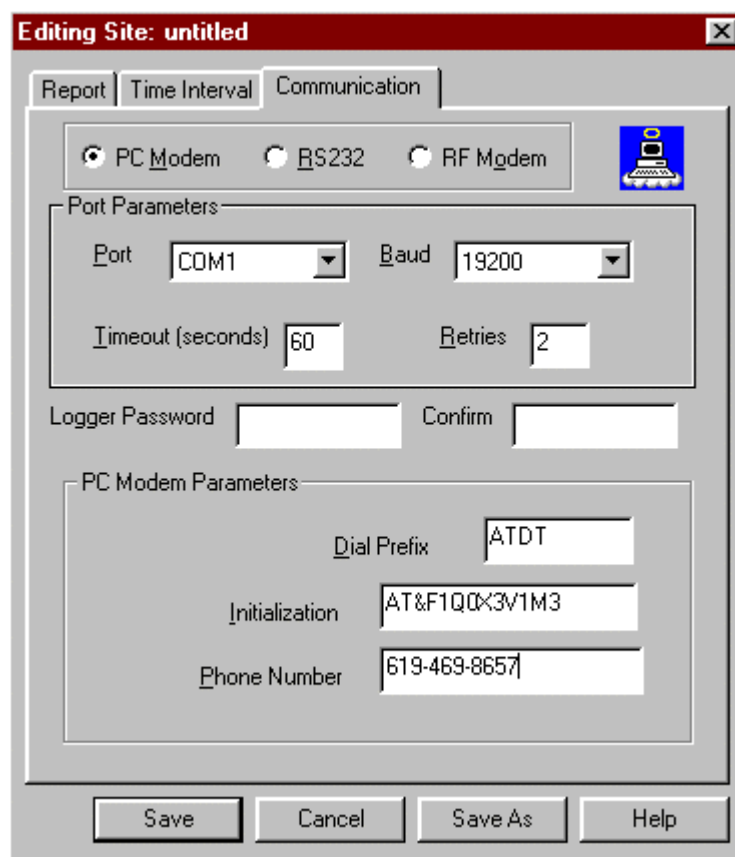


Figure 4.1.2.3b Communication Tab for PC Modem

Each new Parameter on the Communications Tab for PC Modem is defined below: HAP is compatible with any Modem that emulates the Hayes Command Set.

1) Dial Prefix: The Modem command prefix that precedes the telephone number. Typically, most phones are touch-tone and require the "ATDT" prefix. Rotary phones can be used with the "ATD" prefix.

2) Initialization - The modem initialization string. The initialization string illustrated in figure 4.1.2.3b is for a U.S. Robotics 28,800 Sportster Modem. HAP requires the following Modem configuration: (Refer to your modem documentation for proper init string configuration)

- a) Hayes Compatible Modem
- b) The Modem init string must have verbal result codes "ON". If dip switches can be set, verbal result codes are "ON". Most commonly, Hayes compatible init strings include are "Q", "V" and "X". Check your modem manual for the correct commands. By selecting verbal result the modem displays "RING" by using terminal emulation program when the modem is called.
- c) The Modem must be configured for hardware flow control. Typically, an "F" command.
- d) The modems dip switch Auto Answer is off. Make sure the AutoAnswer feature is off in the HAP Modem init string.

3) Phone Number - The phone number of the Omega Engineering Data Logger to be polled.

Figure 4.1.2.3c below illustrates the Communication Tab for a typical RF Modem configuration:

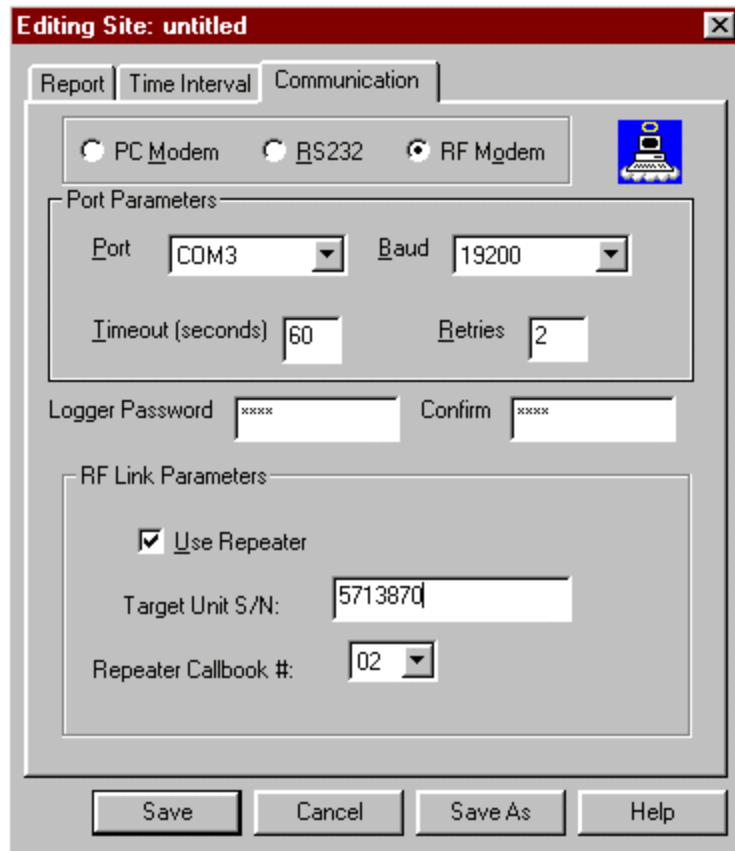


Figure 4.1.2.3c Communication Tab for RF Modem

The Polling software is designed to be compatible with “FreeWave” model DGR-115 RF modem.

Each new Parameter on the Communications Tab for RF Modem is defined below:

- 1) Use Repeater - Provides for the RF Modem option of using repeaters in the RF Modem configuration. The Repeater is a “FreeWave” Hardware device that serves as a communications link between two RF Modems. The Repeater is used to extend the operational distance of the RF Modems. Up to 2 repeaters may be used in an RF Modem configuration. The repeater takes the form of a “FreeWave” model DGR-115 RF Modem, configured as a repeater.
- 2) Target SN - The “FreeWave” serial number of the RF Modem being called. The RF Modem is the one attached to the Omega Engineering data logger.
- 3) Repeater Callbook # - The number only applies when the “Use Repeater” is selected. The “Repeater Callbook #” corresponds to a configuration parameter required by the “FreeWave” RF Modem when in Repeater Mode.

4.1.3 Construction of a Polling File

The HAP dialog to create a Polling File is illustrated below:

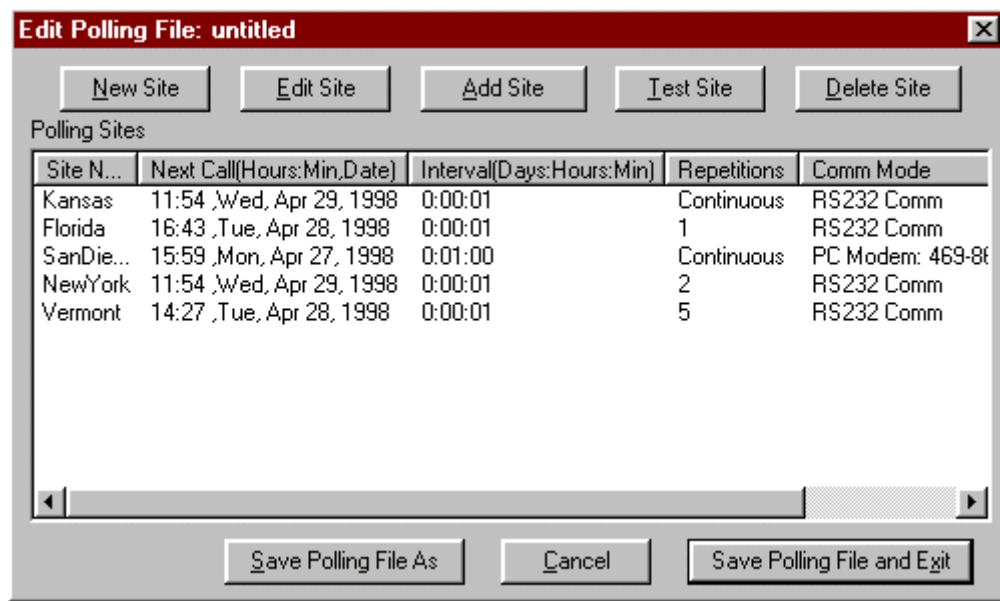


Figure 4.1.3a Edit Polling File Dialog

Figure 4.1.3a illustrates the listing of sites in a new polling file. Each site has been added by selecting the “Add Site” button and the Polling File has not been saved yet. All of the sites have been previously generated with the Site Editor.

The Edit Polling File Dialog may be accessed to generate a new site by:

- 1) Launch HAP program
- 2) Select “New” from the Main Dialog

Each Selection on the Edit Polling File Dialog is defined below:

- 1) New Site - Selecting “New Site” activates the Editing Site Dialog illustrated in Figure 4.1.1. This allows the user to create a new site as discussed in section 4.1.2.
- 2) Edit Site - Selecting “Edit Site” activates a Standard Windows File Selection dialog with a list of Sites. The user then selects a site and the Editing Site Dialog illustrated in Figure 4.1.1 is activated. This allows the user to edit a existing site.
- 3) Add Site - Selecting “Add Site” activates a Standard Windows File Selection dialog with a list of Sites. The user then selects a site and that site is added to the polling file.
- 4) Delete Site - Selecting “Delete Site” eliminates the previously created selected site from the polling file. The following figure illustrates the “LosAngeles” site selected prior to selecting “Delete Site”:

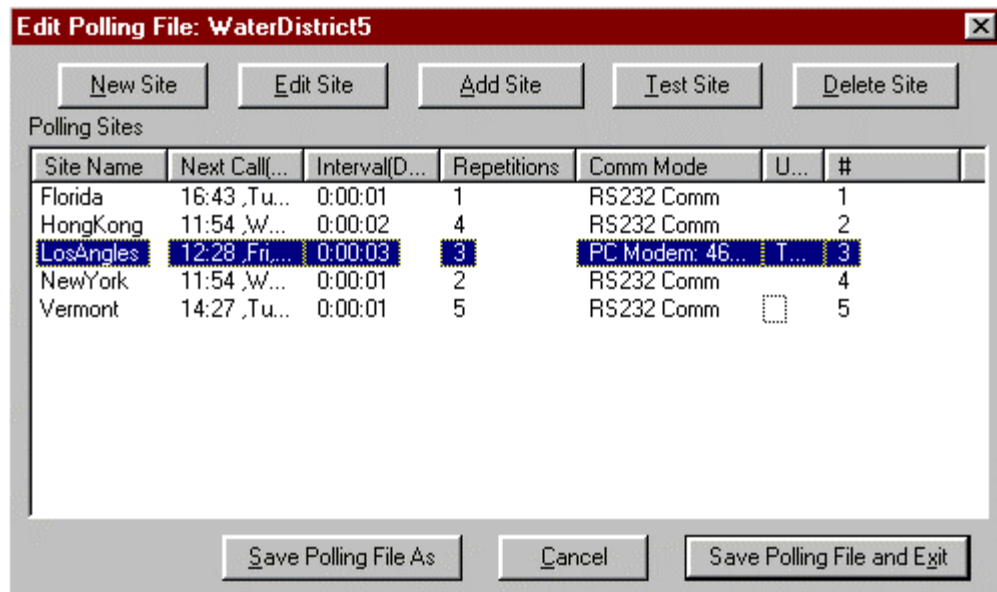


Figure 4.1.3b Edit Polling File Dialog with Selection

Subsequently to selecting “Delete Site” the user is presented with a confirmation dialog:

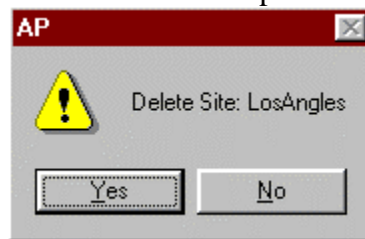


Figure 4.1.3c Delete Site Confirmation Dialog

- 5) Test Site - Selection of test site immediately activates polling for the selected site. Figure 4.1.3b illustrates selection of a site. Once the site is activated for polling, the same site configuration options are active, except for the options selected in the Time Interval Tab Dialog.
- 6) Save Polling File As - Selecting “Save Polling File As” activates a Standard Windows File Selection dialog. The user then selects a polling file name and the polling file is saved to disk.
- 7) Save Polling File And Exit - Selecting “Save Polling File And Exit” activates a Standard Windows File Selection dialog. The user then selects a polling file name and the polling file is saved to disk. The Edit Polling file Dialog is then exited.

4.1.4 Start Polling

Figure 4.1.4a below illustrates the HAP’s main dialog with Polling enabled:

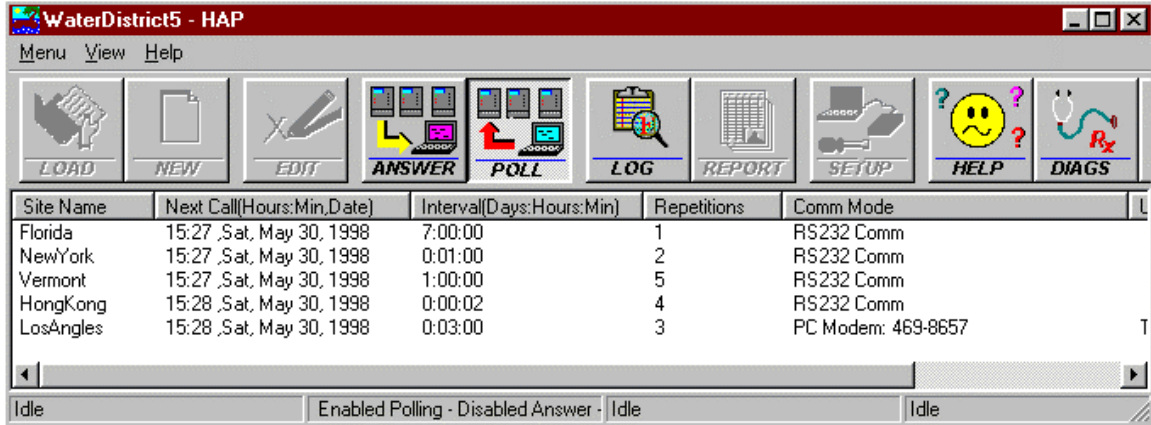


Figure 4.1.4 HAP's Main Dialog with Polling Enabled

To Enable Polling

- 1.) Launch HAP program
- 2.) Select "Load" from HAP's main Dialog - then select a polling file.
- 3.) Select "Poll" from HAP's main Dialog.

When polling is enabled, the polling file name is displayed on the Dialog's title bar. The Dialog Status Bar (at bottom of illustration), displays status of HAP. The Dialog's list window displays some information contained in the selected polling file:

- 1) Site Name - The name of the site.
- 2) Next Call (Hours:Minute:Date) - The next scheduled call for that site. The sites are displayed in chronological order, with the next site to be polled at the top of the site list window.
- 3) Interval (Day:Hours:Minutes) - The interval between logger interrogation for that site.
- 4) Repetitions - The Number of interrogation repetitions remaining for that site
- 5) Comm Mode - How the comm port is used. RS232, PC Modem, or RF Modem.

4.1.5) Termination of Polling

Method for termination of polling consists of:

- 1) All sites have satisfied the "Number of Repetitions".
- 2) The user selects the enabled "Poll" poll button, which disables polling.

4.2) AutoAnswer

4.2.1) Overview

AutoAnswer is a feature of HAP that provides for Omega Engineering Data Logger originated automatic data download and report generation. The Logger interrogation

options include programmable data download, configurable report generation, and automated alarming. AutoAnswer executes in the background while other processes are executing on the PC. A rigorous Log File tracks AutoAnswer operations as each logger calls.

The Omega Engineering Data Logger is programmed using Omega Engineering HyperWare with a “HAP” icon in the program net. Once the HAP Icon is activated, the Data Logger initiates a callout to a PC with HAP executing. The HyperWare HAP Icon is illustrated below. For a more complete description of HyperWare see the HyperWare Manual.

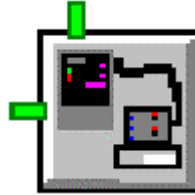


Figure 4.2.1 HyperWare HAP Icon

Note

The above Icon illustrated in figure 4.2.1 above is **not** a part of HAP. The Icon is a part of Omega Engineering HyperWare software.

4.2.2) Turning AutoAnswer On and Off

Figure 4.2.2 below illustrates the HAP Main Dialog with AutoAnswer On. The user has selected the “Answer” button to turn on AutoAnswer. The PC running HAP is now ready to receive calls from an Omega Engineering Logger with the HAP Icon activated.

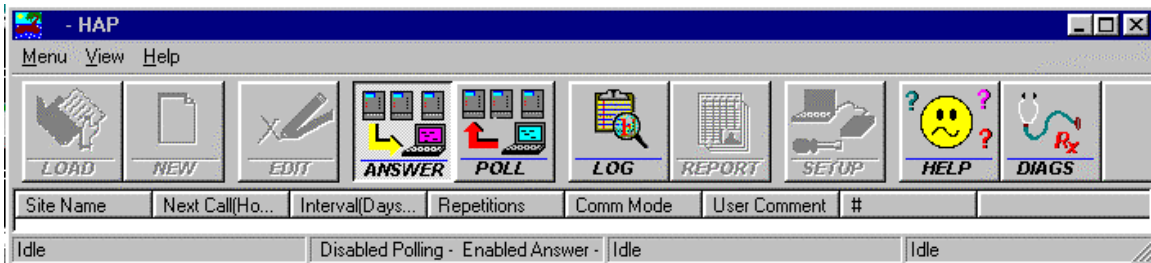


Figure 4.2.2 HAP with AutoAnswer On

When AutoAnswer is on, the comm port is opened with the parameter specified in the Setup Dialog. See the next section for a description of those parameters.

AutoAnswer is disabled by selected the enabled “Answer” button. Once disabled the comm port is freed for other applications using the comm port.

4.2.3) Setup Of AutoAnswer

To Access AutoAnswer

- 1.) Launch HAP program
- 2.) Select “Setup” from HAP’s main Dialog

Figure 4.2.3a below illustrates AutoAnswer configured to communicate with a Logger in PC Modem mode.

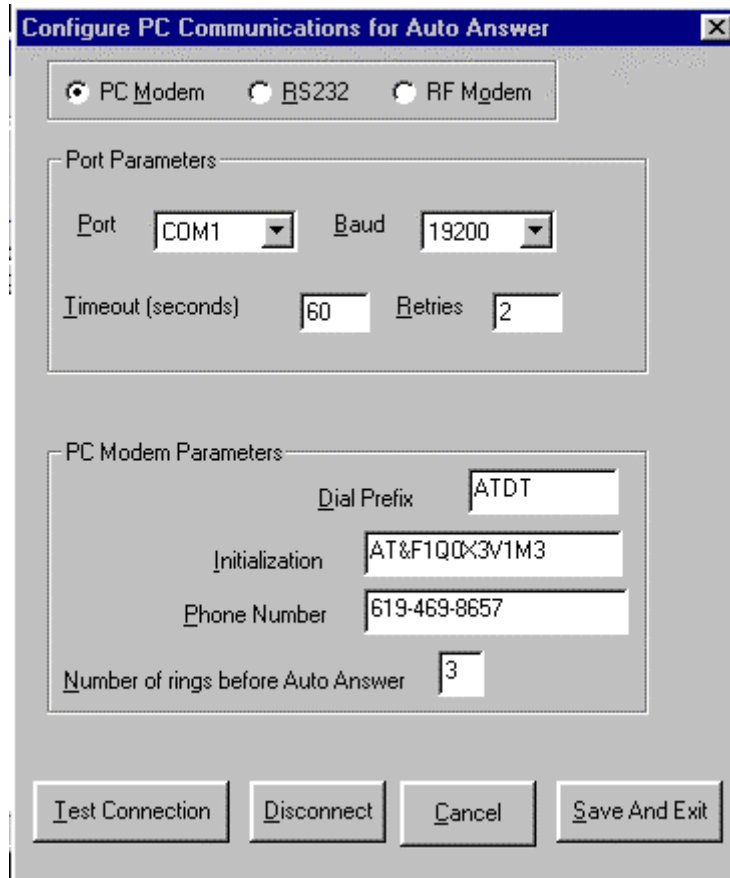


Figure 4.2.3a AutoAnswer Setup Dialog Configured for PC Modem

Description of each Parameter and button on the AutoAnswer Setup Dialog:

- 1) Port - PC port for AutoAnswer activation.
- 2.) Baud - PC Port Baud Rate
- 3) Timeout - N/A in AutoAnswer Mode - only used when testing the connection. See "Test Connection" button.
- 4) Retries - N/A in AutoAnswer Mode - only used when testing the connection.
- 5) Dial Prefix - Hayes compatible prefix. ATDT for touch tone and ATD for rotary.
- 6) Initialization - Hayes compatible mode initialization string . See section 4.1.2 for some initialization guidelines.
- 7) Phone Number - N/A in AutoAnswer Mode - only used for testing the connection.

8) Number of rings before Auto Answer - the number of times the phone rings before HAP connects to the calling logger. This option allows the user to answer the phone, bypassing HAP.

9) Test Connection - Performs a Logger callup using the displayed parameters.

10) Disconnect - Hangs-up on the logger

11) Cancel - Exit without saving parameters

12) Save and Exit - stores the displayed parameter and uses them with AutoAnswer is activated.

Dialog Figure 4.2.3b below illustrates AutoAnswer configured to communicate with a Logger using the RS232

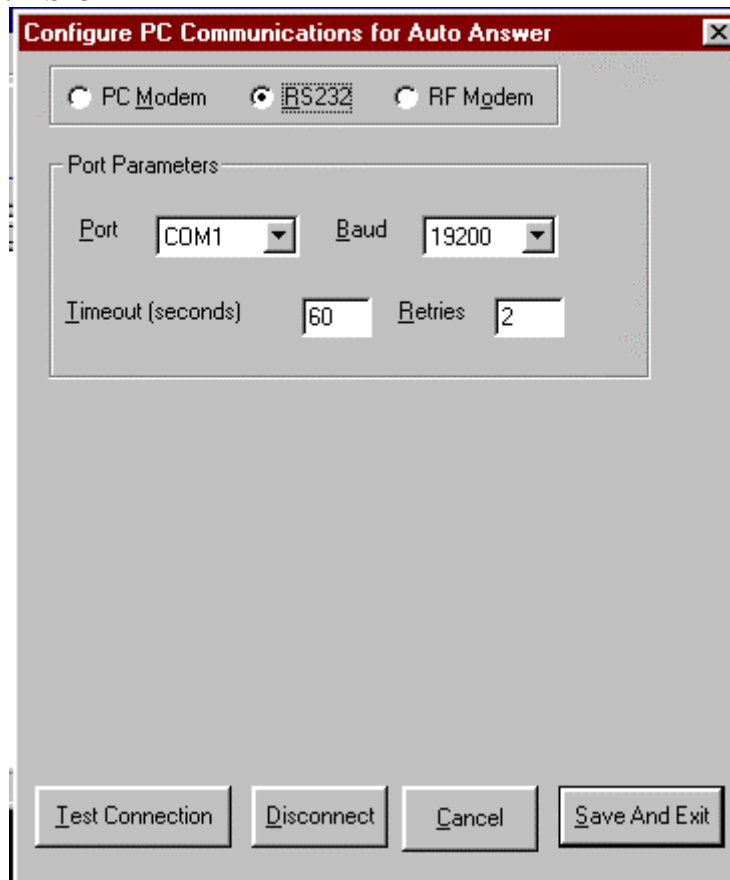


Figure 4.2.3b AutoAnswer Setup Dialog Configured for RS232

For a description of the RS232 parameters see the above section.

Dialog Figure 4.2.3c below illustrates AutoAnswer configured to communicate with a Logger using the RF Modem.

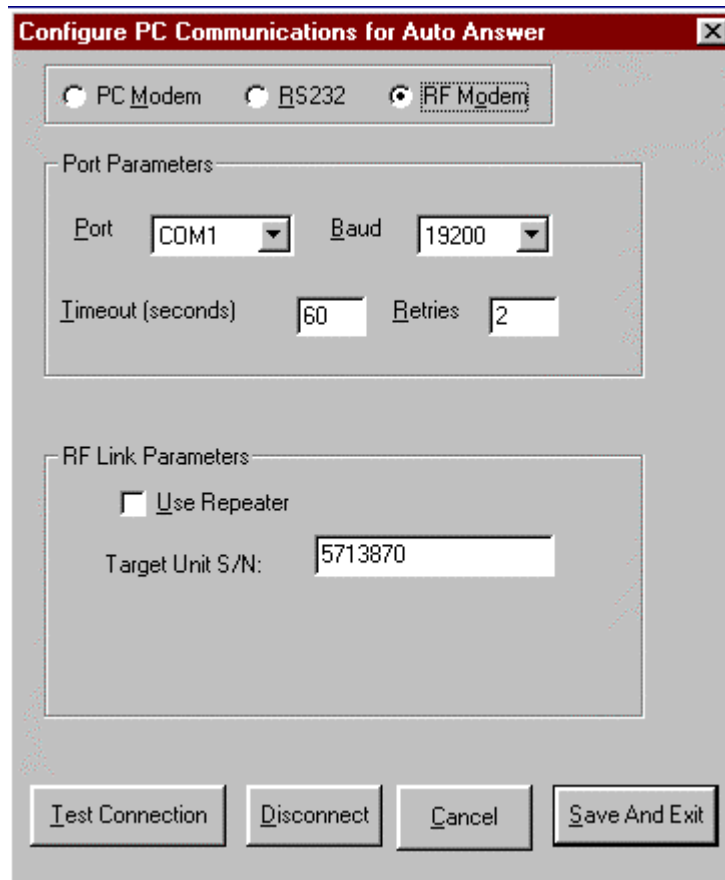


Figure 4.2.3c AutoAnswer Setup Dialog Configured for RF Modem

See the section above and Section 4.1.2.3 above for a description of RF Modem parameters.

4.2.4) AutoAnswer Options

Omega Engineering HyperWare is used to select options for HAP AutoAnswer. HyperWare is the PC Windows platform application used to program Omega Engineering Data Loggers. See the Omega Engineering HyperWare Manual for a complete description of HyperWare.

Figure 4.2.4 below illustrates the HyperWare HAP Icon Dialog. The Dialog is accessed by:

- 1.) Launch HyperWare
- 2) Select Design a Net Program Icon
- 3) Select the “Insert a Hap Output Icon” button from the Toolbar
- 4) Drag and Drop the Hap Icon into the programming window.
- 5) Double Click on the Hap Icon. The HyperWare HAP Icon Dialog is illustrated below:

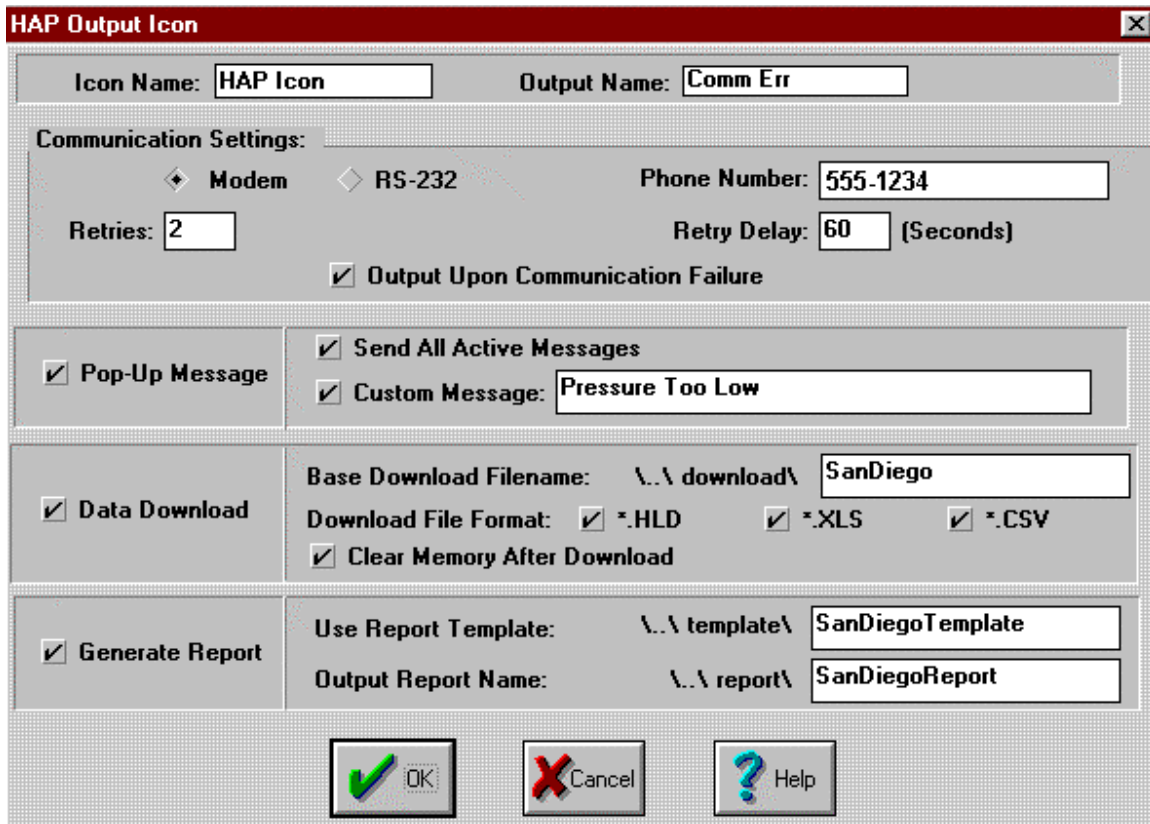


Figure 4.2.4a HyperWare HAP Icon Dialog

Note

The above Dialog illustrated in figure 4.2.4a above is **not** a part of HAP. The Dialog is a part of Omega Engineering HyperWare software.

Description of each Parameter and button in figure 4.2.4 - HyperWare HAP Icon Dialog

- 1) Telephone Mode, RS232, or RF Modem - the comm method the data logger uses to communicate with HAP.
- 2) Retries - The number of retries the logger will attempt if the first communication attempt is unsuccessful.
- 3) Retry Delay: The seconds between retries.
- 4) Output on Communication failure - Optional parameter that installs an output node on the HAP Icon. An example of using this option: Connect the Hap Output Node to a Pager Icon with a alphanumeric message. If a communication failure occurs, the Pager Icon is activated.
- 5) Phone Number- The telephone Number of the PC with HAP installed and AutoAnswer enabled. The Logger uses this telephone number when the HAP Icon is activated.

- 6) RF Mode Serial Number - See section 4.1.2.3 above for a description of this parameter.
- 7) Use Repeater - See section 4.1.2.3 above for a description of this parameter.
- 8) Repeater Number - See section 4.1.2.3 above for a description of this parameter. This parameter is the same as “Repeater Callbook #”
- 9) Popup Message - HAP displays all active messages and custom messages after the logger call HAP. HAP uses Microsoft NotePad to display the popup messages.
Example of Popup Message:

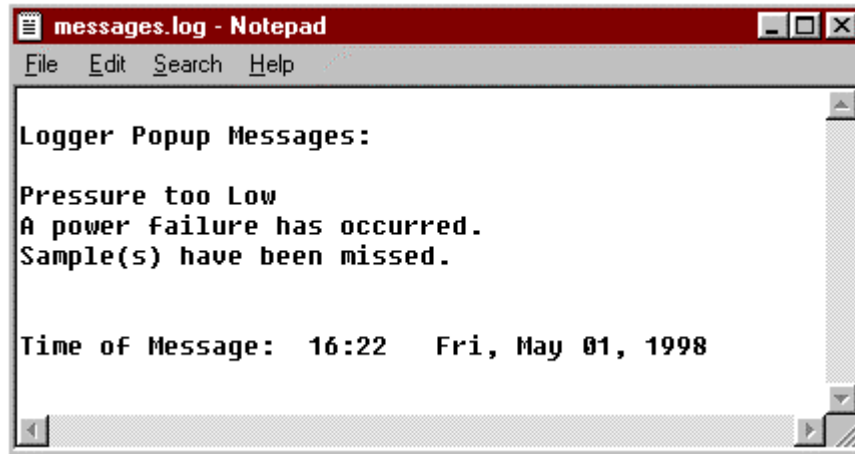


Figure 4.2.4b Alarm - Popup Message displayed by HAP

Figure 4.2.4b Alarm - Popup messages consists of three message types:

- a) The first message “Pressure too Low” is a custom message, typed in by the user when configuring the HAP Icon from HyperWare.
 - b) Alarm - Popup messages 2 and 3 “A power failure has occurred.” and “Sample(s) have been missed” are Logger Active message used to indicate system failures.
 - c) A message that has been programmed into the Logger net by using the LCD message Icon.
- 10) Data Download - Indicates HAP should download memory data from the logger.
 - 11) Base download Filename - The file name HAP assigns to the downloaded memory data.
 - 12) HLD - HAP will create a HLD format downloaded logger data. The HLD format is used by HyperPlot utility. File name convention is explained to section 4.1.2.1.
 - 13) CSV - HAP will create a CSV format downloaded logger data. The CSV format is the generic comma delimited text file used by Mat Lab or Excel.

14) XLS - HAP will create a XLS format downloaded logger data. The XLS format is the binary format used by Microsoft Excel.

15) Generate Report - HAP generates an Microsoft Excel report as explained in section 4.1.2.1

16) User Report Template - File name of the Excel template as explained in section 4.1.2.1. Generating an Excel Template is explained in section 4.3 of this manual.

17) Output Report Name - HAP generate a Excel Report with this file name.

18) Clear Memory after Download - Clears the Logger memory after the data download.

Figure 4.2.4c, below illustrates a simple HyperWare net using the HAP icon. Once this net is uploaded to the logger and the GPGDI input is activated, the logger calls a PC running HAP. HAP AutoAnswer Options are specified by double clicking the HAP Icon. Figure 4.2.4a HyperWare HAP Icon Dialog above illustrates the Dialog once the HAP Icon is selected. This Dialog allows the user to configure HAP AutoAnswer with interrogation options initialed by the Logger.

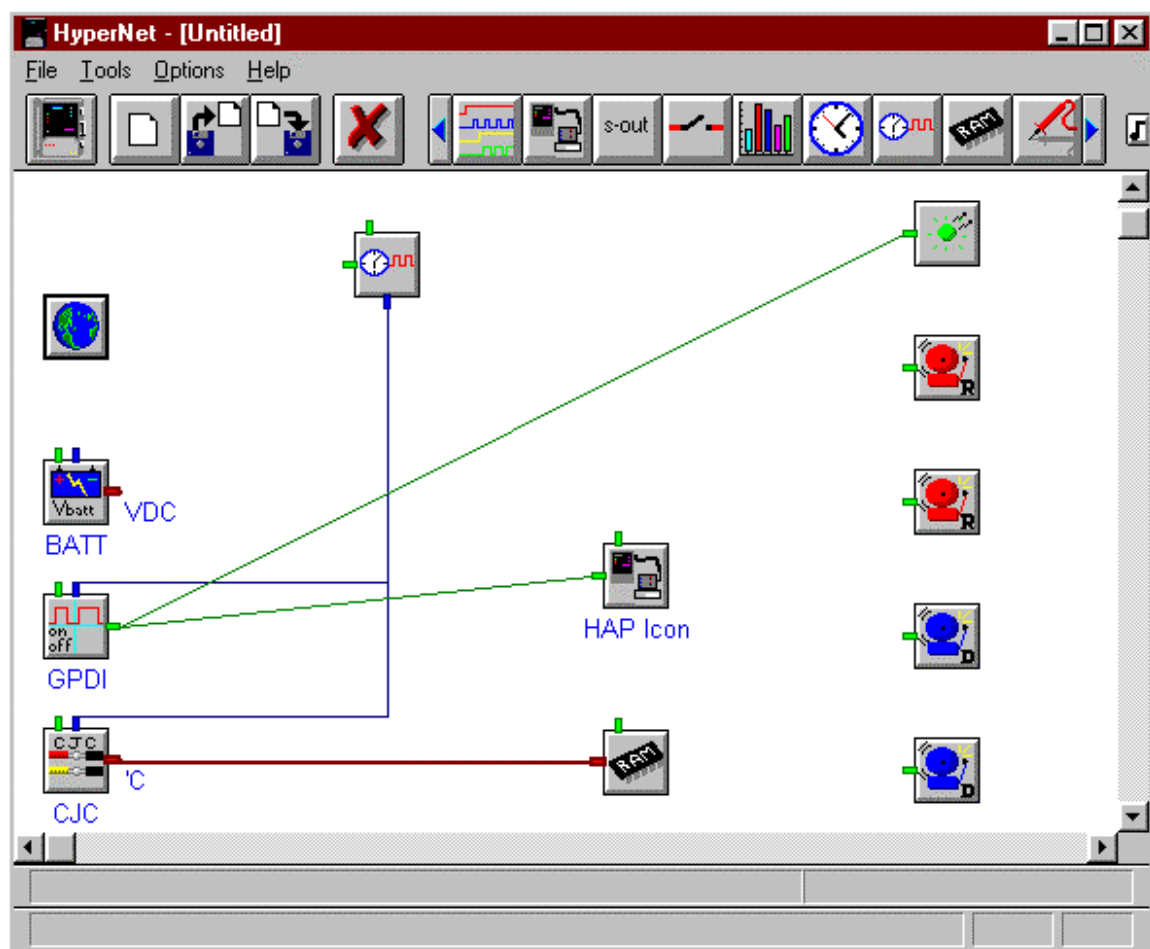


Figure 4.2.4c HyperWare Simple Net With HAP Icon

Note

The above Dialog illustrated in figure 4.2.4a above is **not** a part of HAP. The Dialog is a part of Omega Engineering HyperWare software.

4.3) Excel Report Configuration

4.3.1) Overview

HAP can easily be configured to generate an Excel report subsequent to a logger interrogation. HAP uses a Microsoft Excel file as a “template”. The “template” file is configured with Data Logger commands. During the Logger interrogation, HAP scans the template file for Logger commands, interrogates the Logger with appropriate logger commands, and writes an Excel report file. The “template” file specifies report file format, interrogation options, and Excel Macros. Both AutoPoll and AutoAnswer can use the Excel Report generation option of HAP. The user generates a “template” using the HAP Excel template generation feature, the template is specified in AutoPoll or AutoAnswer configuration, then HAP generates an Excel Report during Logger interrogation. HAP is compatible with Microsoft Excel version 5.0 and above.

4.3.2) Creating an Excel Template for HAP

Figure 4.3.2a below illustrates the Report button used to activate the Excel Template generation feature of HAP.



Figure 4.3.2a Report Button on HAP’s Main Dialog

After selecting the Report button the Excel Report Dialog appears:

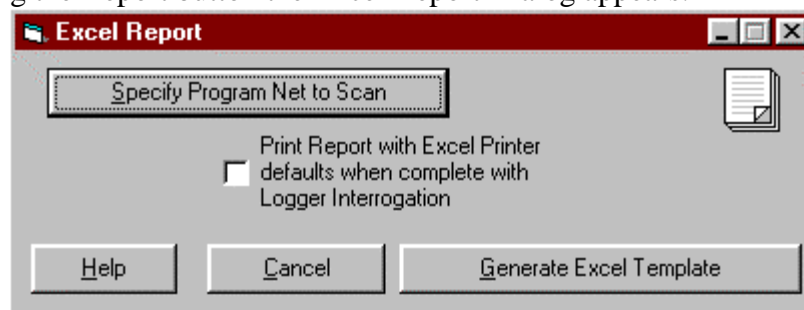


Figure 4.3.2b Excel Report Dialog for HAP Excel Template Generation

Description of each Parameter and button in figure 4.3.2b

1) Specify Program Net to Scan - The Hyperware program *.net file is selected. The logger contains a net program. The net is saved as a PC *.net file. HAP requires the *.net file prior to “Generate Excel Template”. See the HyperWare Manual for description of a net program. The file dialog to select a *.net file illustration:

Figure 4.3.2d Microsoft Excel Template for HAP

4.3.3)Explanation of Excel Template for HAP

During Logger interrogation and Excel Report Generation, HAP scans the Excel template file for Logger commands. Figure 4.3.2.d above illustrates a Excel Template File. Each cell on the worksheet is scanned for a Logger command. A Logger command is delimited by ~~ (double tilde). The report is configured in this template file. For example, if “Operation Mode” is not required in the report the ~~o - Operation Mode ~~ text is removed from the worksheet. Logger commands may be deleted from a worksheet but not added. The available Logger commands are imported into Excel prior to template generation.

Text , formatted text, and Macros may be added to the Excel template. HAP executes the HAP custom Macro : “MasterMac” during report generation. Macro calls may be added to “MasterMac” for execution of any user defined macros during report generation.

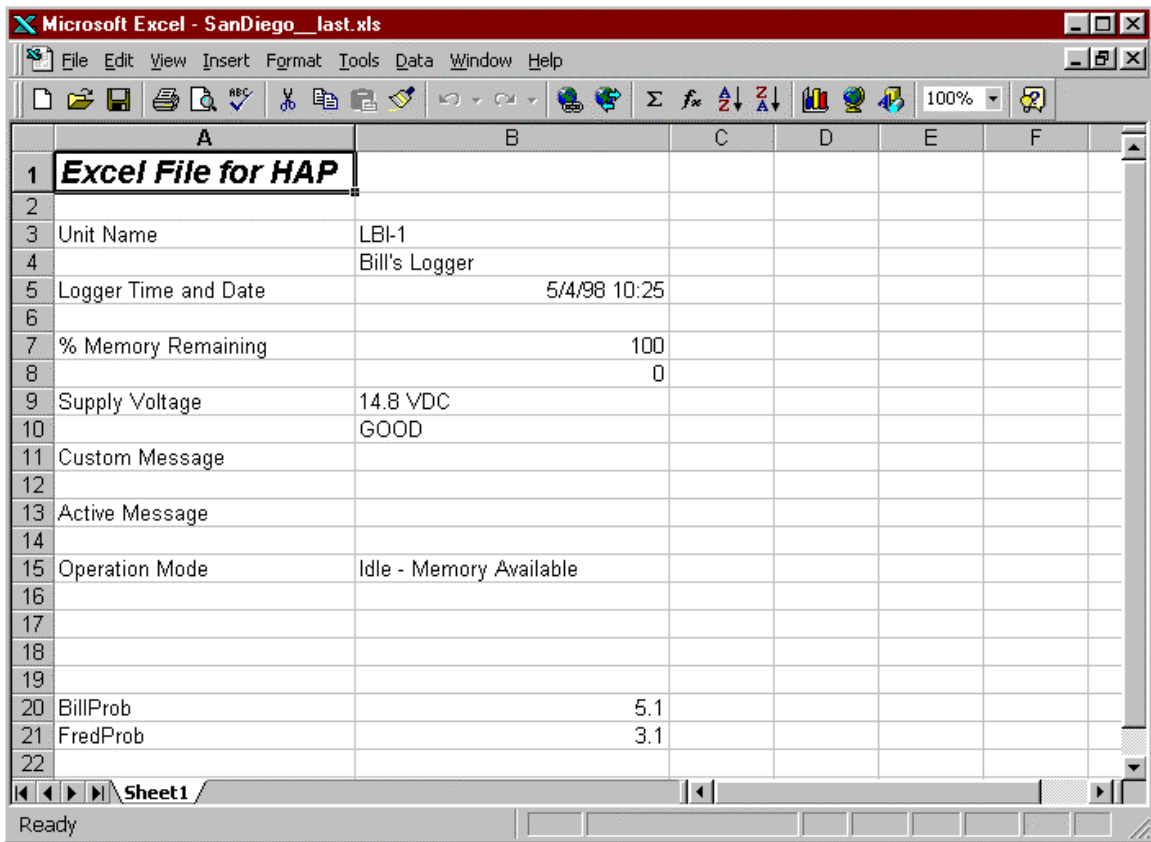


Figure 4.3.3 Microsoft Excel Report Generated by HAP

Figure 4.3.3 illustrates the Excel Report File generated using the Template file illustrated in figure 4.3.2d.

5 Step by Step Examples - using HAP

5.1) AutoPoll - One site example

5.1.1) Generating a Program Net with HyperWare, example 5.1

Figure 5.1.1 below illustrates example 5.1 HyperWare net program.

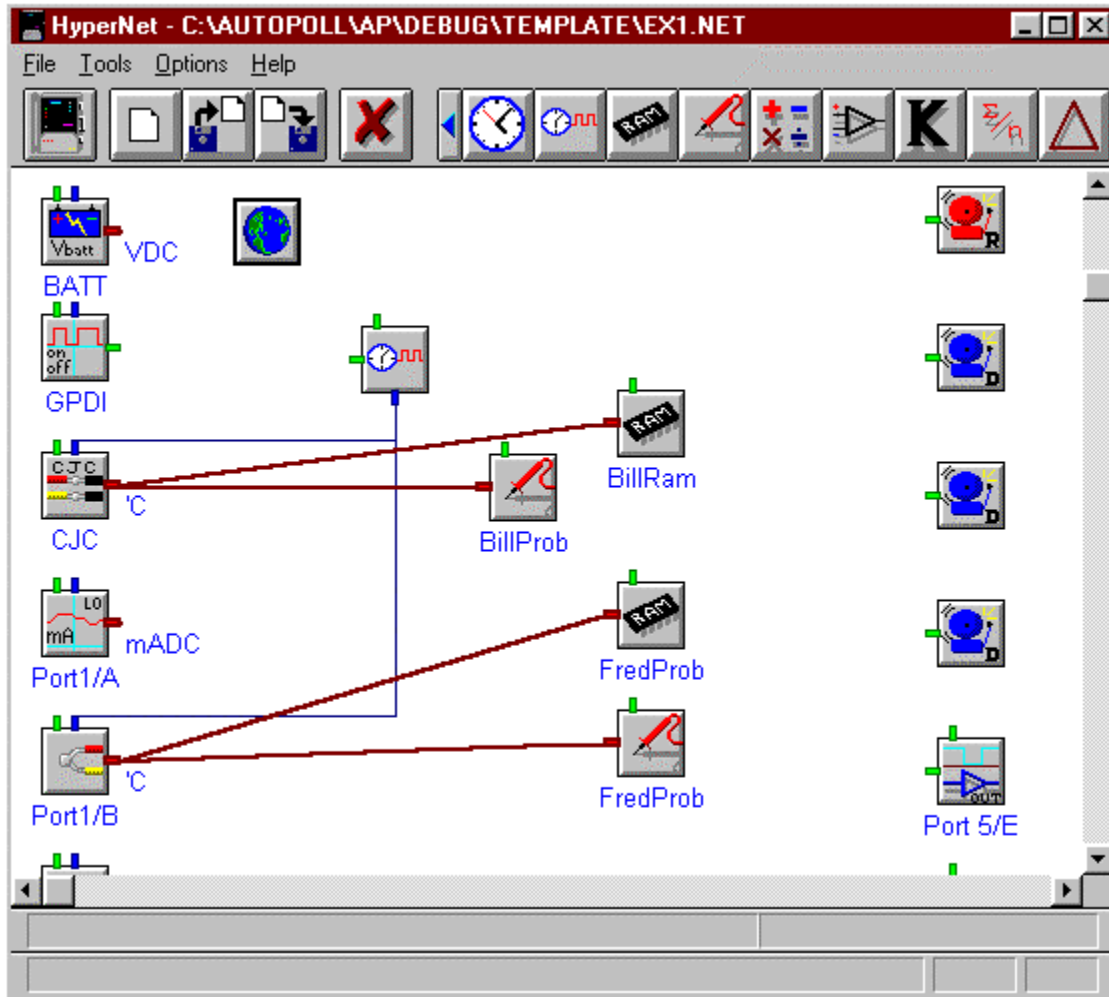


Figure 5.1.1 HyperWare net program, Example 5.1

- 1) Generate the above net, using HyperWare.
- 2) Save the net program as "ex1.net", using HyperWare.
- 3) Upload the net to the Logger, using HyperWare.
- 4) Enable the Logger, using HyperWare.

5.1.2) Generating a HAP Excel Template with HAP, example 5.1

- 1) Launch HAP
- 2) Select "Report"
- 3) Select "Specify Program Net to Scan"

4) Select “ex1.net”, the net illustrated in figure 5.1.1. Figure 5.1.2a below illustrates the selection of “ex2.net”. This file dialog appears subsequent to selecting “Specify Program Net” from HAP’s Report Generator.

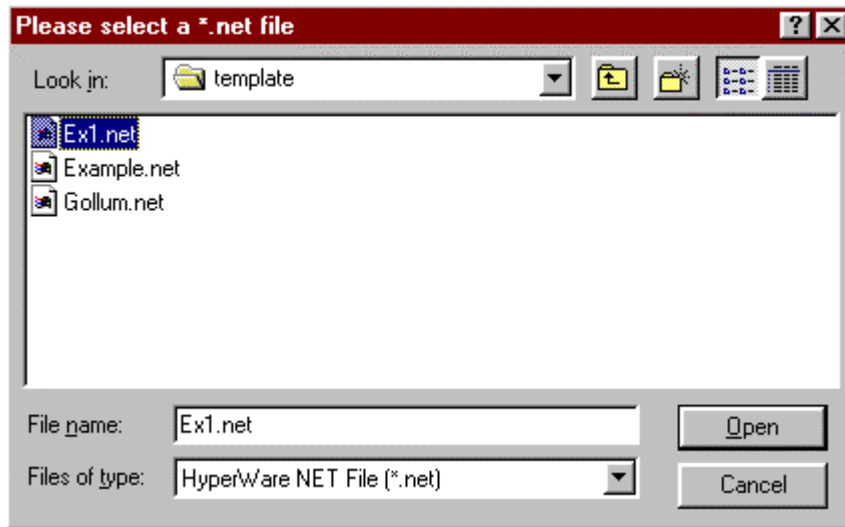


Figure 5.1.2a Selecting the *.net file with HAP’s Report Generator, Example 5.1

5) Select “Generate Excel Template” From HAP Report Generator Dialog. Excel is launched with the Generic template displayed:

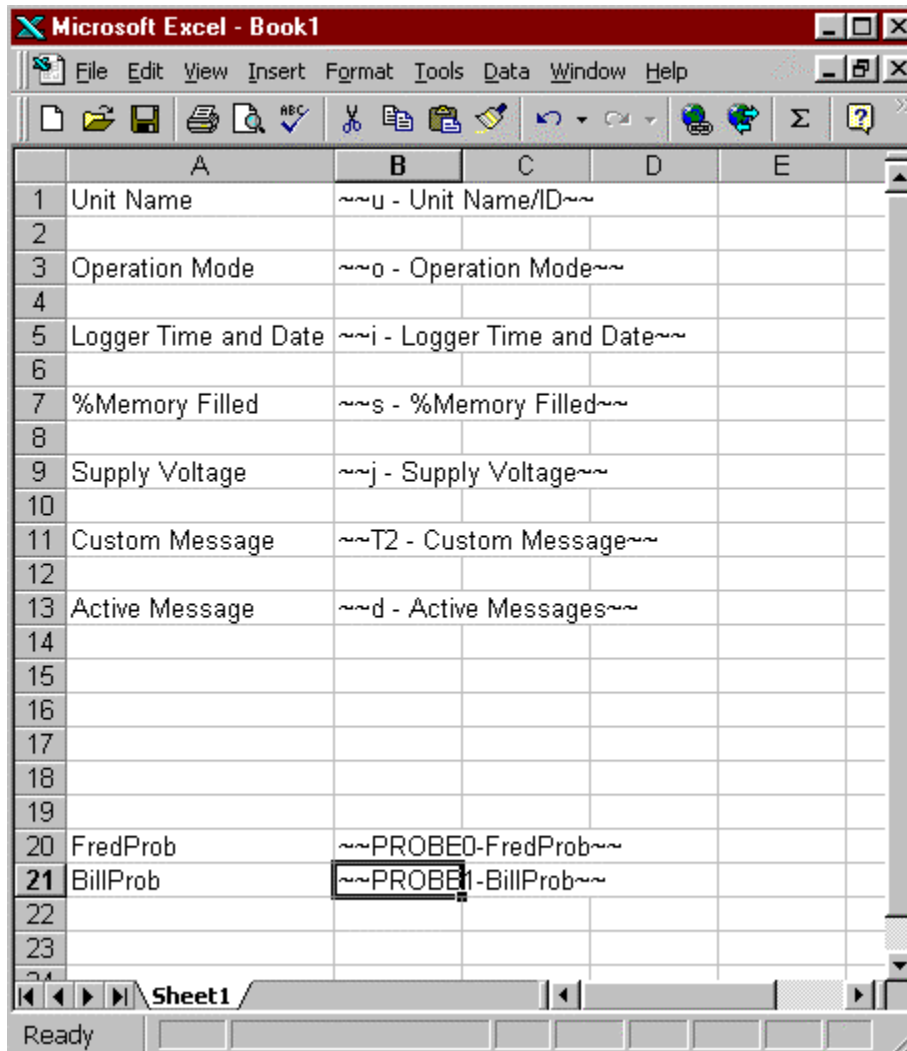


Figure 5.1.2b Generated Template by HAP before user edit, Example 5.1

6) Edit the template illustrated in Figure 5.1.2b. After edit, the template is illustrated by:

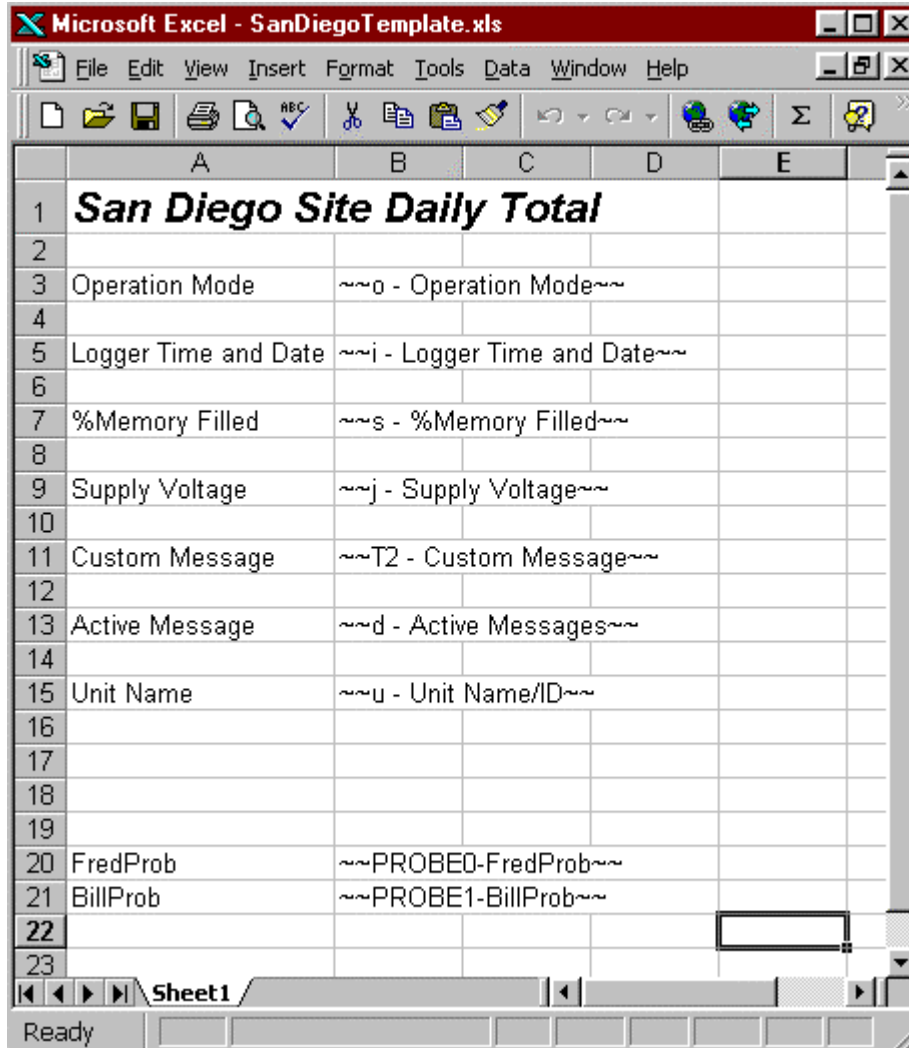


Figure 5.1.2c User Edited HAP Excel Template, Example 5.1

7) Make the Excel Template illustrated above.

8) Save the template as “SanDiegoTemplate.xls”.

5.1.3) Generating a Site and Polling file HAP, example 5.1

1) Select “New” from HAP’s main dialog.

2) Select “New Site” from the Edit Polling File Dialog. The Dialog illustrated in figure 4.1.1 now appears.

3) Select the following Report options as illustrated in figure 5.1.3a below:

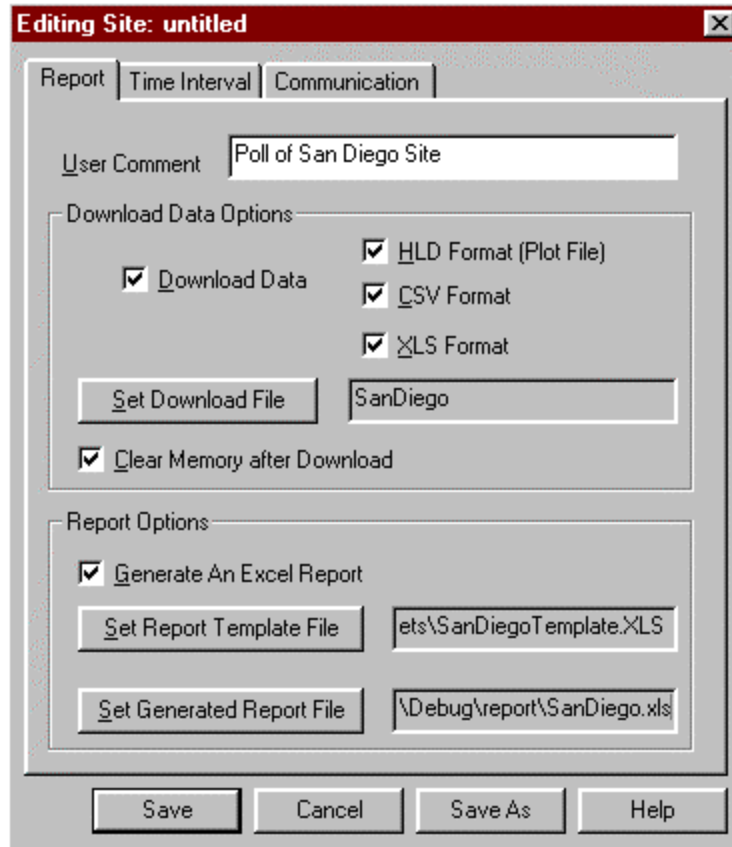


Figure 5.1.3a Report Tab, Example 5.1

4) Select the following Time Interval options as illustrated in figure 5.1.3b below:

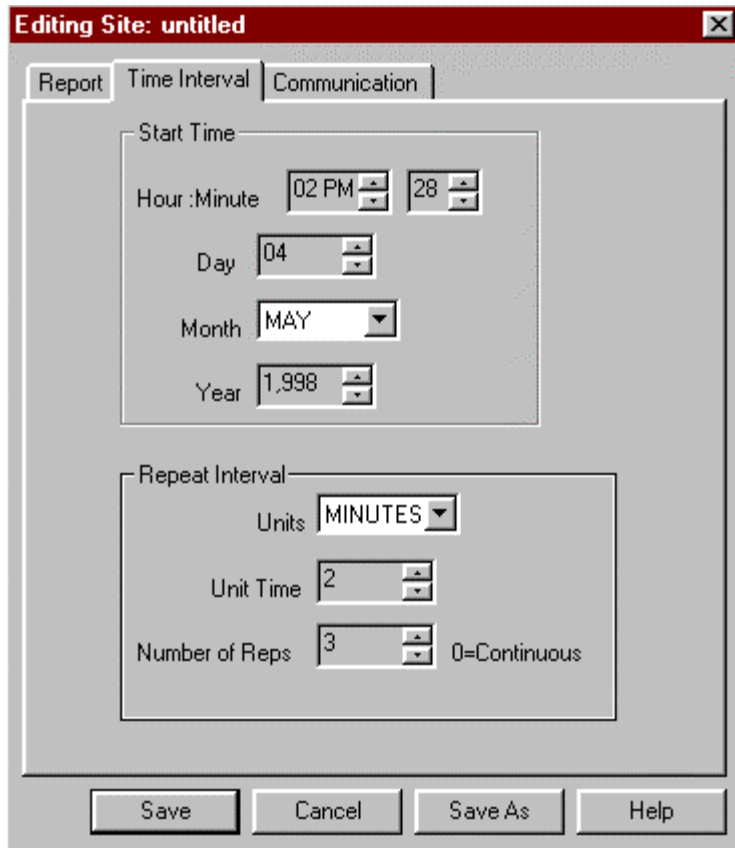


Figure 5.1.3b Time Interval Tab, Example 5.1

5) Select communication parameters. The 5.1.3.c below illustrates a logger connected to the RS232 Comm 1 port, with no password:

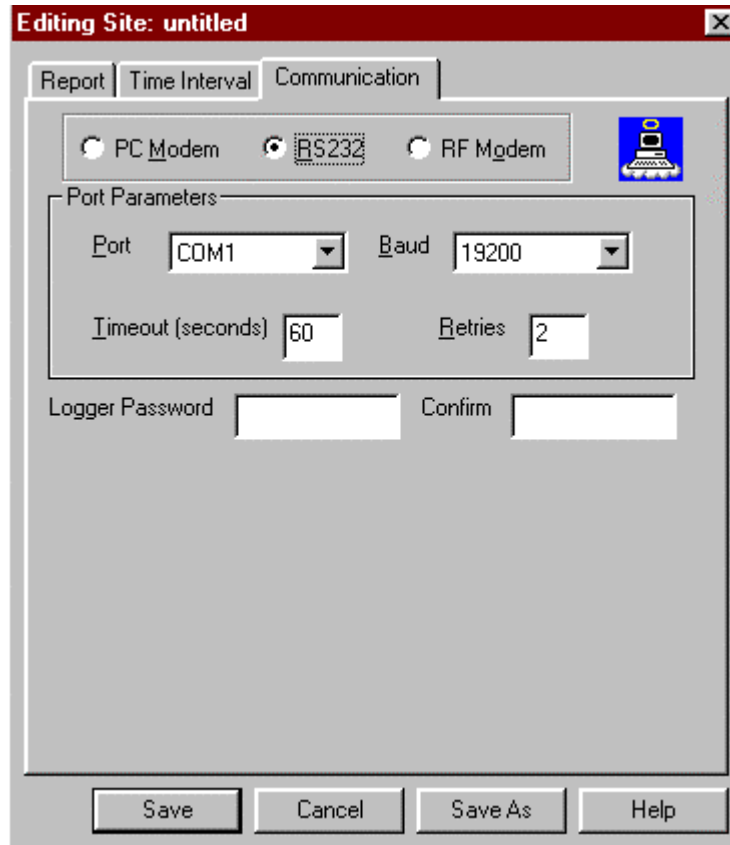


Figure 5.1.3c Communications Tab, Example 5.1

6) Select "Save" from the Editing Site Dialog. Save the site as "SanDiego".

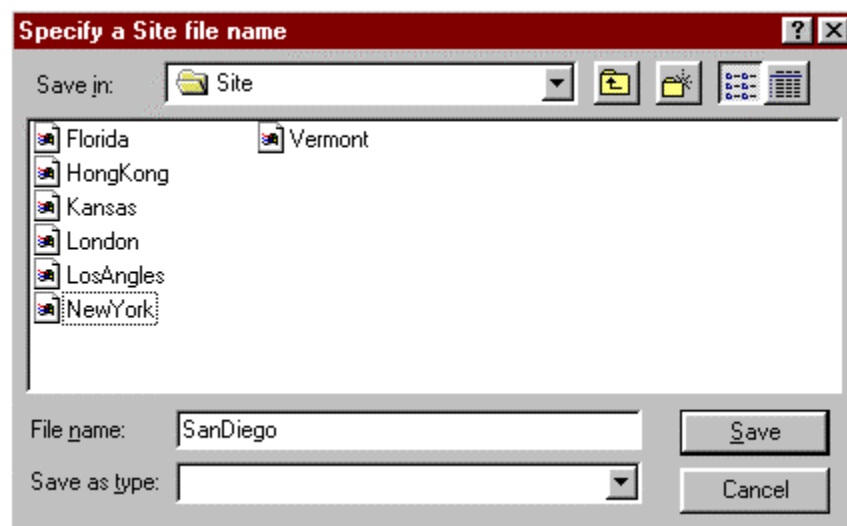


Figure 5.1.3d Saving the Site, Example 5.1

The Edit Polling File Dialog contains a listing that includes the SanDiego Site, as below in figure 5.1.3e.

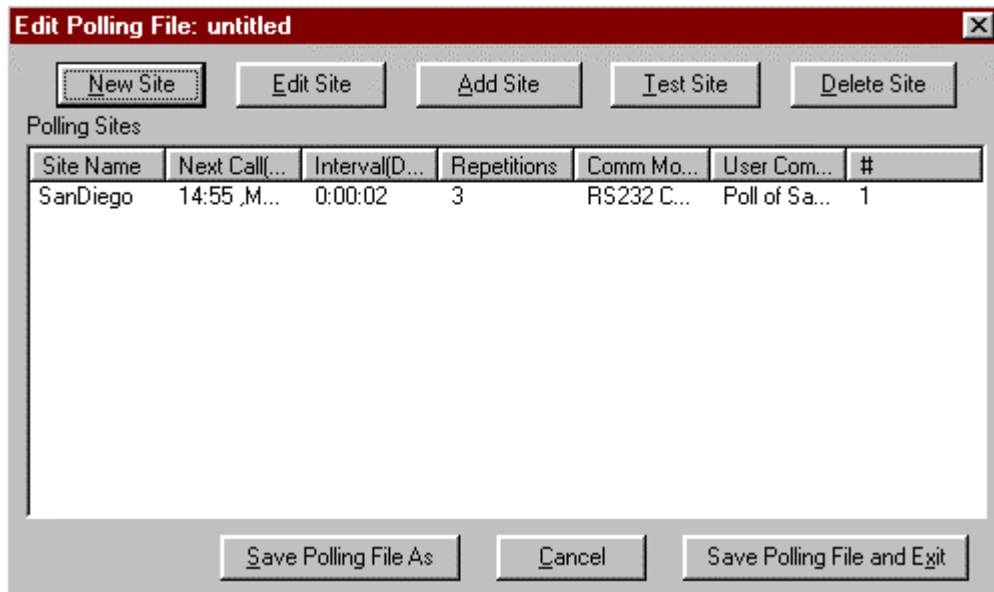


Figure 5.1.3e Edit Polling File Dialog, Example 5.1

- 7) Select "Save Polling File and Exit" from the Edit Polling file Dialog. Save the polling file as California. Figure 5.1.3f illustrates saving the polling file as "California".

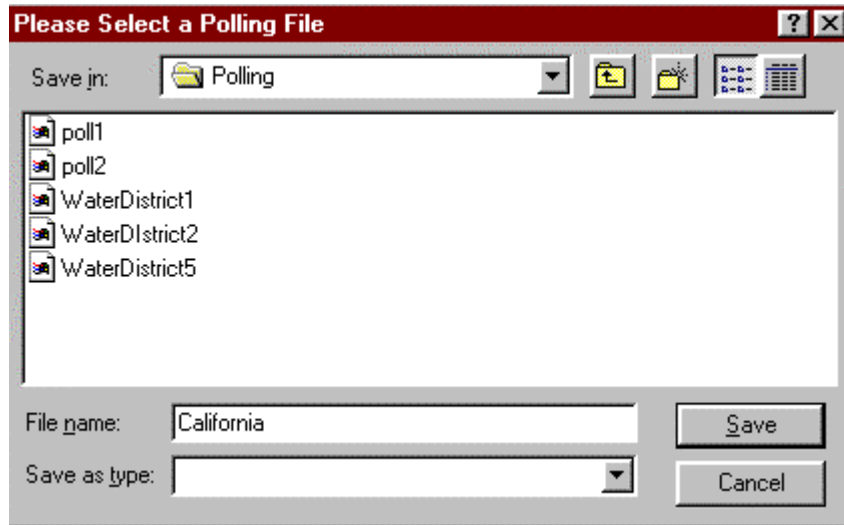


Figure 5.1.3f Saving the polling file, Example 5.1

5.1.4) Enabling AutoPoll, example 5.1

- 1) Load the polling file "California". Select "Load" from HAP's main dialog:

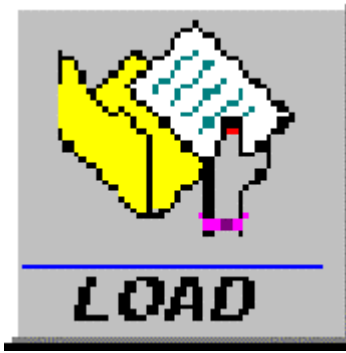


Figure 5.1.4a Load Button for HAP, Example 5.1

2) Select Poll from HAP main Dialog:

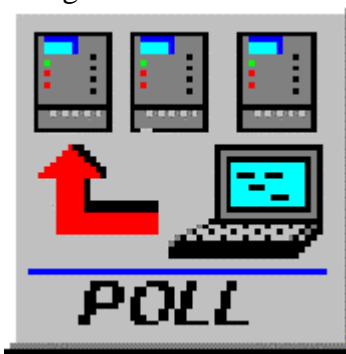


Figure 5.1.4b Poll Button for HAP, Example 5.1

After “Poll” is selected the “Adjust Start Time” illustrated in figure 5.1.4c appears

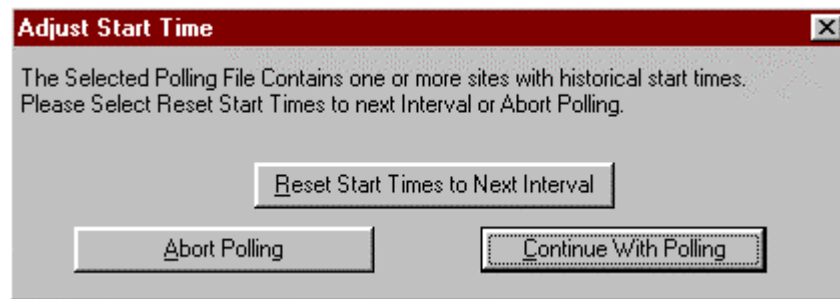


Figure 5.1.4c Adjust Start Time Dialog, Example 5.1

Prior to polling, all the site information in the polling file is checked for start times. If any of the start times are historical, the start times may automatically adjusted by selecting “Reset Start Times to Next Interval”, and continue polling. If you wish to manually adjust the start times , it must be done through the site editor.

5.1.5) Watching HAP Poll , example 5.1

Figure 5.1.5a below illustrates HAP’s main dialog during the poll of the SanDiego site. The 4 status panes at the bottom of the dialog indicate Data Memory is being downloaded and it is more than 50% complete.

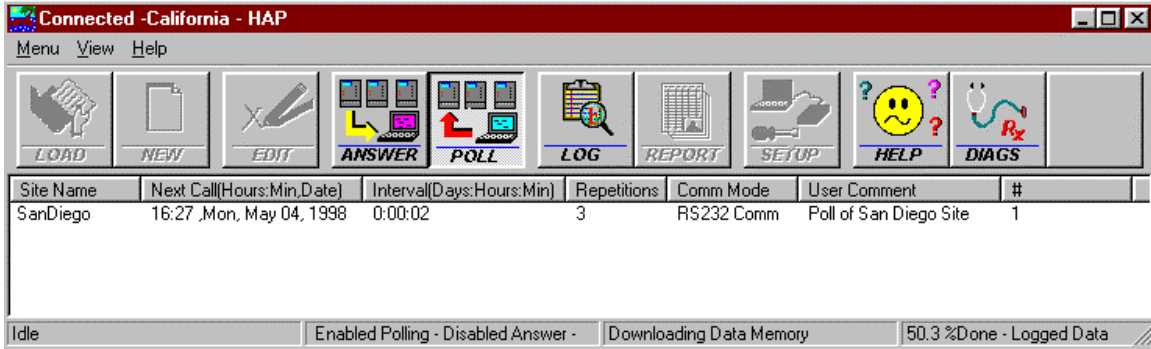


Figure 5.1.5a Watching HAP poll - downloading data, Example 5.1

Figure 5.1.5b below illustrates HAP's main dialog with polling complete.

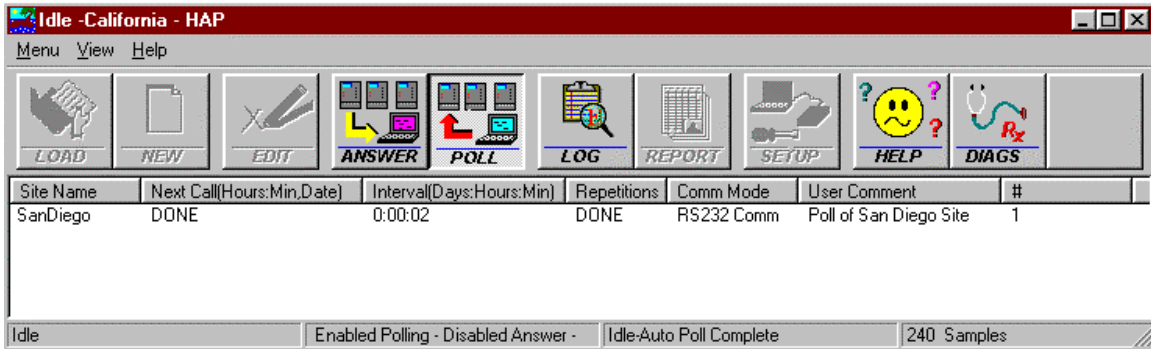


Figure 5.1.5b Watching HAP poll - polling is complete, Example 5.1

5.1.6) Checking HAP's Log File, example 5.1

Select the "Log" button to display the log file. Figure 5.1.6 below illustrates a the log file after example 5.1 is finished polling.

```

=====
C:\autopoll\AP\Debug\SITE\SanDiego      :Site Name
Poll of San Diego Site
PC Time of Interrogation:  16:28   Monday, May 04, 1998
RS232 Comm
Number of Samples Written : 4390
HLD file written : C:\autopoll\AP\Debug\download\SanDiego__2.hld
C:\autopoll\AP\Debug\download\SanDiego__2.xls
C:\autopoll\AP\Debug\download\SanDiego__2.csv
C:\autopoll\AP\Debug\template\SanDiegoTemplate.xls
C:\autopoll\AP\Debug\report\SanDiego__last.xls copied to C:\autopoll\AP\Debug\report\SanDiego__3.xls
C:\autopoll\AP\Debug\report\SanDiego__last.xls
Logger Cleared
Reps Remaining : 2
Interrogation Complete

=====
C:\autopoll\AP\Debug\SITE\SanDiego      :Site Name
Poll of San Diego Site
PC Time of Interrogation:  16:29   Monday, May 04, 1998
RS232 Comm
Number of Samples Written : 242
HLD file written : C:\autopoll\AP\Debug\download\SanDiego__3.hld
C:\autopoll\AP\Debug\download\SanDiego__3.xls
C:\autopoll\AP\Debug\download\SanDiego__3.csv
C:\autopoll\AP\Debug\template\SanDiegoTemplate.xls
C:\autopoll\AP\Debug\report\SanDiego__last.xls copied to C:\autopoll\AP\Debug\report\SanDiego__4.xls
C:\autopoll\AP\Debug\report\SanDiego__last.xls
Logger Cleared
Reps Remaining : 1
Interrogation Complete
=====
For Help, press F1

```

Figure 5.1.6 HAP Log file after polling, Example 5.1

5.1.7) Data Analysis, example 5.1

Example 1 generates the following output files:

1) download\SanDiego__1.hld, download\SanDiego__2.hld, and download\SanDiego__last.hld. These correspond to the downloaded data logger memory file in HyperPlot format. SanDiego__last.hld is the most current file.

2) download\SanDiego__1.csv, download\SanDiego__2.csv, and download\SanDiego__last.csv. These files are CSV (comma delimited text file), with the same information that is in the HLD file. The most current CSV file is SanDiego__last.csv.

3) download\SanDiego__1.xls, download\SanDiego__2.xls, and download\SanDiego__last.xls. These files are XLS (Excel binary file), with the same information as what is in the HLD file. The most current file is SanDiego__last.xls. Figure 5.1.7 illustrates SanDiego__last.xls with some additional calculations added by the user:

	A	B	C	D	E	F	G	H	I
1	Date/Time	Elapsed Time	BillRam	FredProb					
2	mm/dd/yy	Seconds							
3	05/04/98 1	0.464166671	26.31397247	27.35938					
4	05/04/98 1	1.464166641	26.31397247	27.5713			Ave FredProbe=	27.44233	
5	05/04/98 1	2.464166641	26.31397247	27.5713					
6	05/04/98 1	3.464166641	26.31397247	27.5713			Max FredProbe=	27.80762	
7	05/04/98 1	4.464166641	26.30225372	27.56007					
8	05/04/98 1	5.464166641	26.30225372	27.77247			Min FredProbe=	27.13526	
9	05/04/98 1	6.464166641	26.31397247	27.5713					

Figure 5.1.7 SanDiego__last.xls with some additional calculations, Example 5.1

Additional calculations in Figure 5.1.7 include Average FredProbe, Max FredProbe and Min FredProbe in column H. These calculation were performed using the standard Excel formula calculation features.

4) report\SanDiego__1.xls, report\SanDiego__2.xls, and report\SanDiego__last.xls. These files are the Excel Report files. The most current file is SanDiego__last.xls.

5.2) AutoPoll - Five site example

Example 5.2 requires an understanding of example 5.1. Please read Example 5.1 before continuing. In this example the “California” polling file is edited to create 4 additional sites. Each site has one logger with a telephone modem connected. The loggers have been pre-programmed with nets similar as illustrated in figure 5.1.1. This five site example downloads data from each logger on a periodic basis.

5.2.2) Modification of Polling File, example 5.2

- 1) Launch HAP.
- 2) Edit polling file “California”
- 3) Select “New Site”
- 4) Create the new site “Sacramento”. Figures 5.2.2a through 5.2.2d illustrates creation of the site “Sacramento”

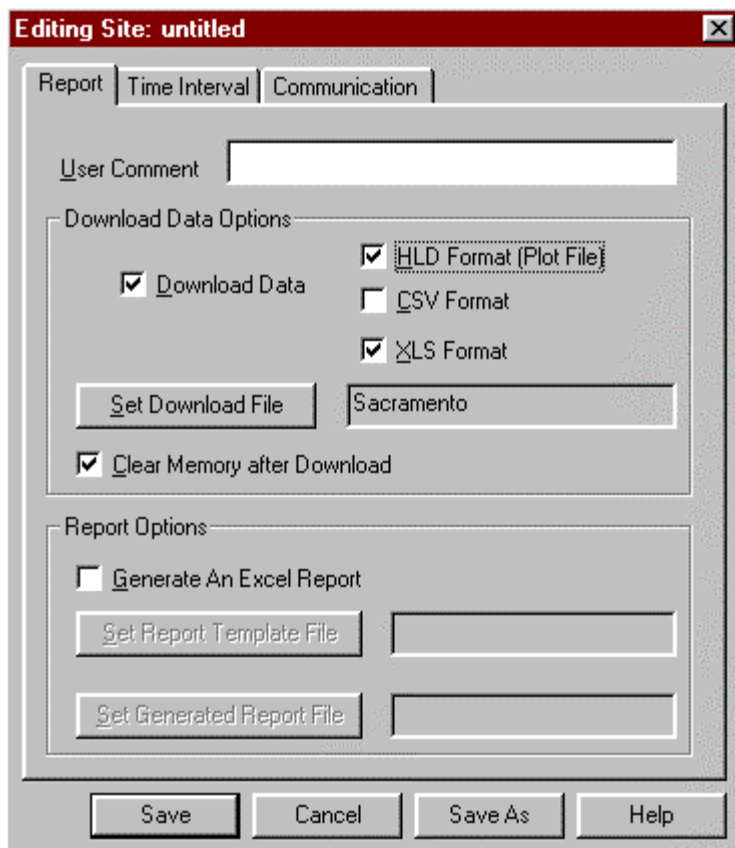


Figure 5.2.2a Report Tab for creation of a new site, Example 5.2

The image shows a software dialog box titled "Editing Site: untitled" with three tabs: "Report", "Time Interval", and "Communication". The "Time Interval" tab is active. It contains two main sections: "Start Time" and "Repeat Interval".

Start Time Section:

- Hour:Minute: 10 AM (Hour) and 04 (Minute)
- Day: 05
- Month: MAY
- Year: 1,998

Repeat Interval Section:

- Units: DAYS
- Unit Time: 7
- Number of Reps: 0 (with a note "0=Continuous")

At the bottom of the dialog box are four buttons: "Save", "Cancel", "Save As", and "Help".

Figure 5.2.2b Time Interval Tab for creation of a new site, Example 5.2

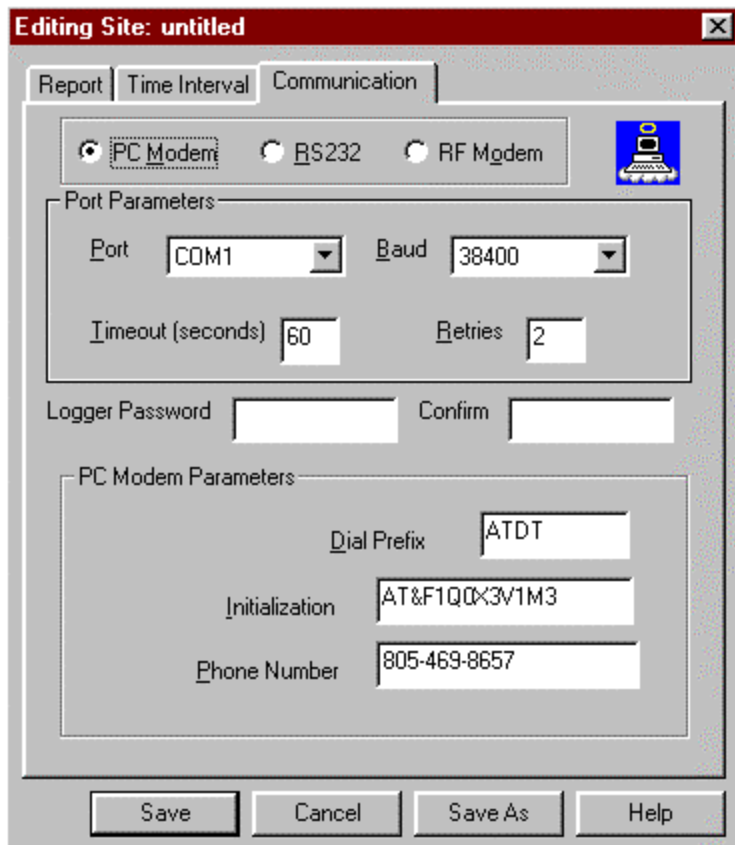


Figure 5.2.2c Communications Tab for creation of a new site, Example 5.2

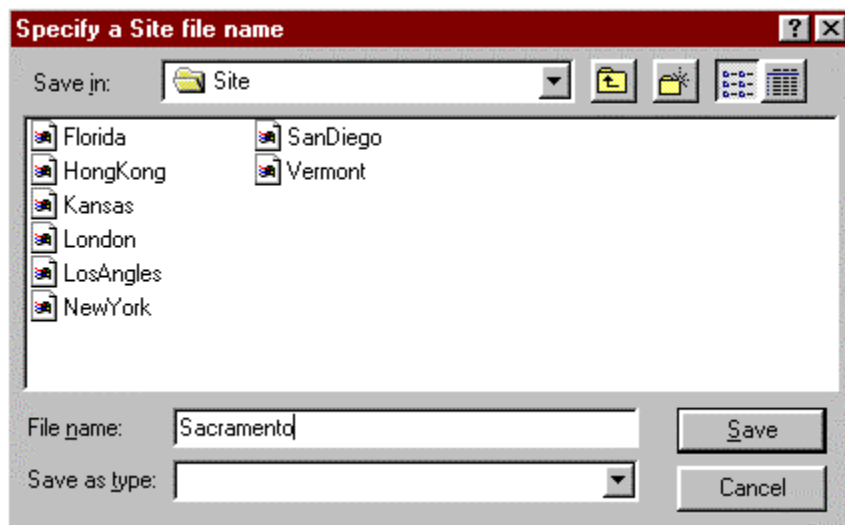


Figure 5.2.2d Saving the Site Dialog, Example 5.2

5) Create the additional sites: SanFran, ElCentro, and Riverside.

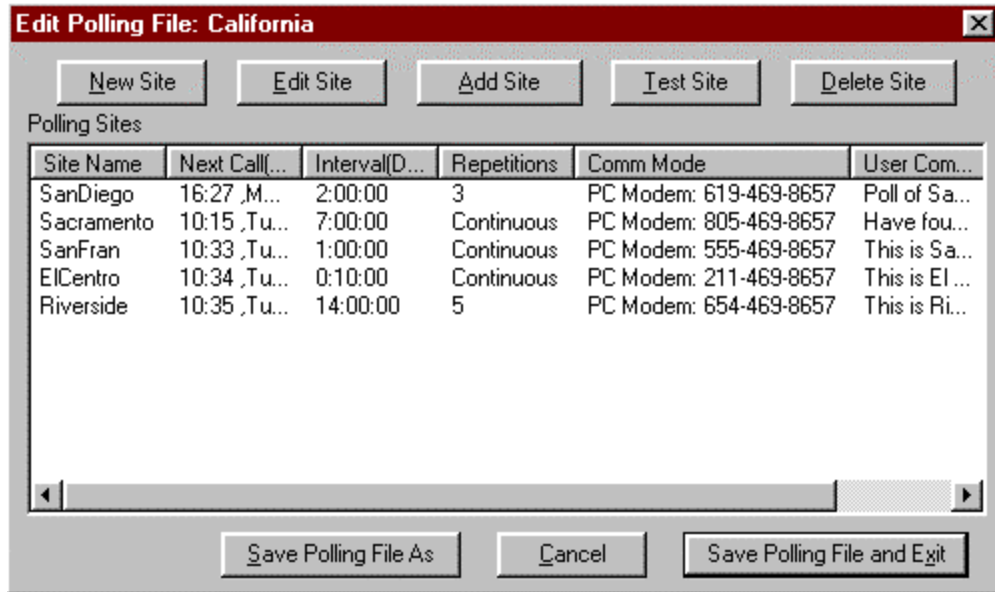


Figure 5.2.2e Edit Polling File after creating 5 sites, Example 5.2

6) Select “Save Polling File and Exit” from the Edit Polling file Dialog illustrated above.

5.2.3) Executing AutoPoll, example 5.2

1) Load the “California” polling file by selecting “Load” from HAP’s main dialog.

2) Enable Autopolling by selecting “Poll” from HAP’s main dialog

Figure 5.2.1 illustrates HAP AutoPoll Enabled using the “California”

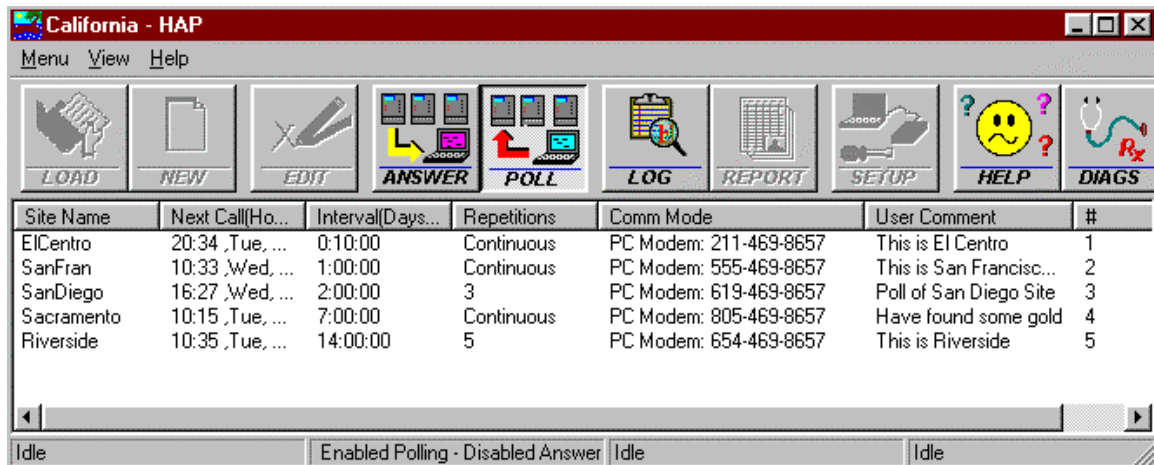


Figure 5.2.3 HAP’s main dialog with AutoPoll Enabled, Example 5.2

3) HAP is minimized, and can execute in the background. The PC running HAP must not be shut off when AutoPoll is enabled. HAP’s main dialog Next Call column lists the next call time for each site. The Interval Column lists the time interval between each poll. The Repetitions Column lists the number of times the site is called. The Comm Mode column lists the telephone number of each site.

4) HAP continues to poll sites until “Poll” is selected again, disabling AutoPoll. The log file lists the status of the poll. Select “Log” from HAP’s main dialog to display the log file.

5.3) AutoAnswer - Logger calling PC with HAP.

5.3.1) HyperWare’s creation of net program with HAP Icon, example 5.3

1) Create the net illustrated below in figure 5.3.1a.

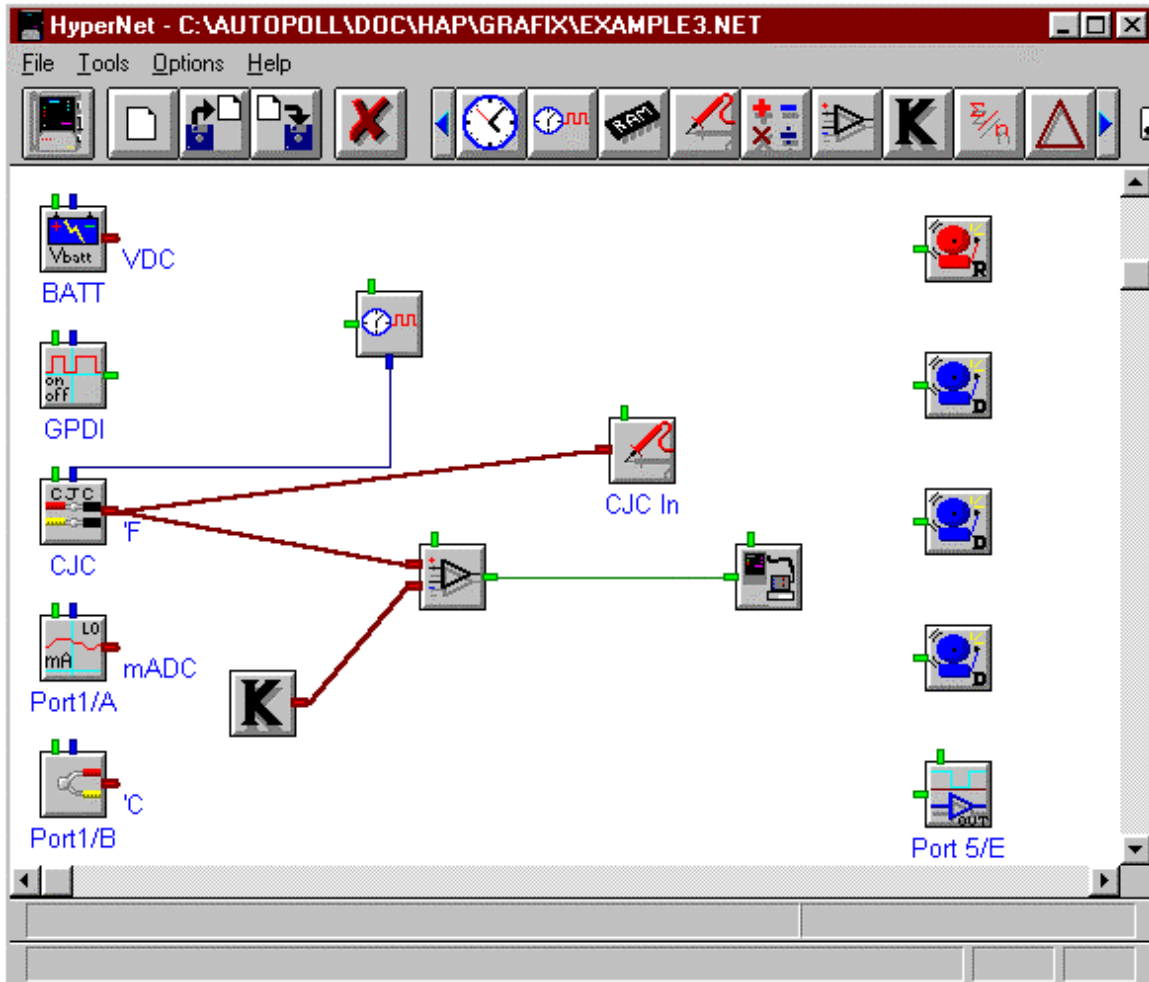


Figure 5.3.1a HyperWare Net Program, Example 5.3

The above Net program uses the CJC logger external input wired to a thermister. The constant “K” is set at 80 degrees. Once the room warms up to 80 degrees the HAP Icon is activated and the PC executing HAP is called.

2) Configure the HAP icon as illustrated below in figure 5.3.1b, except use the telephone number connected to your PC.

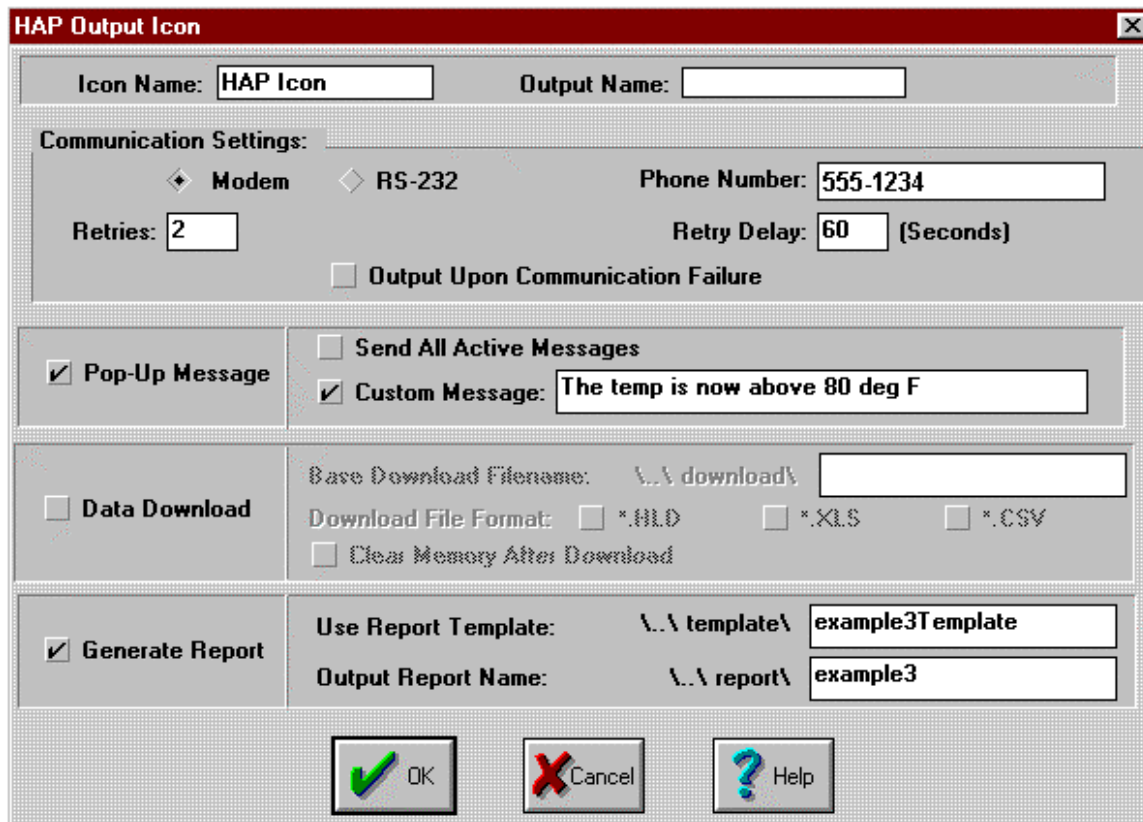


Figure 5.3.1b HyperWare HAP Icon Dialog, Example 5.3

3) Upload the net to the logger.

When the room temperature goes above 80 degrees F, the logger initiates a callup using the phone number illustrated in figure 5.3.1b above. The phone number has a PC modem connected with HAP AutoAnswer enabled. For test purposes you can set the “K” temperature to anything for a HAP Icon activation.

5.3.2) HAP’s Excel Template creation, example 5.3

- 1) Launch HAP.
- 2) Select “Report” from HAP’s main dialog.
- 3) Select “Specify Program Net to Scan”.
- 4) Select the net file illustrated in figure 5.3.1a.
- 5) Select “Generate Excel Template”.
- 6) Microsoft Excel now appears with the generic HAP template. Modify the template file as illustrated below:

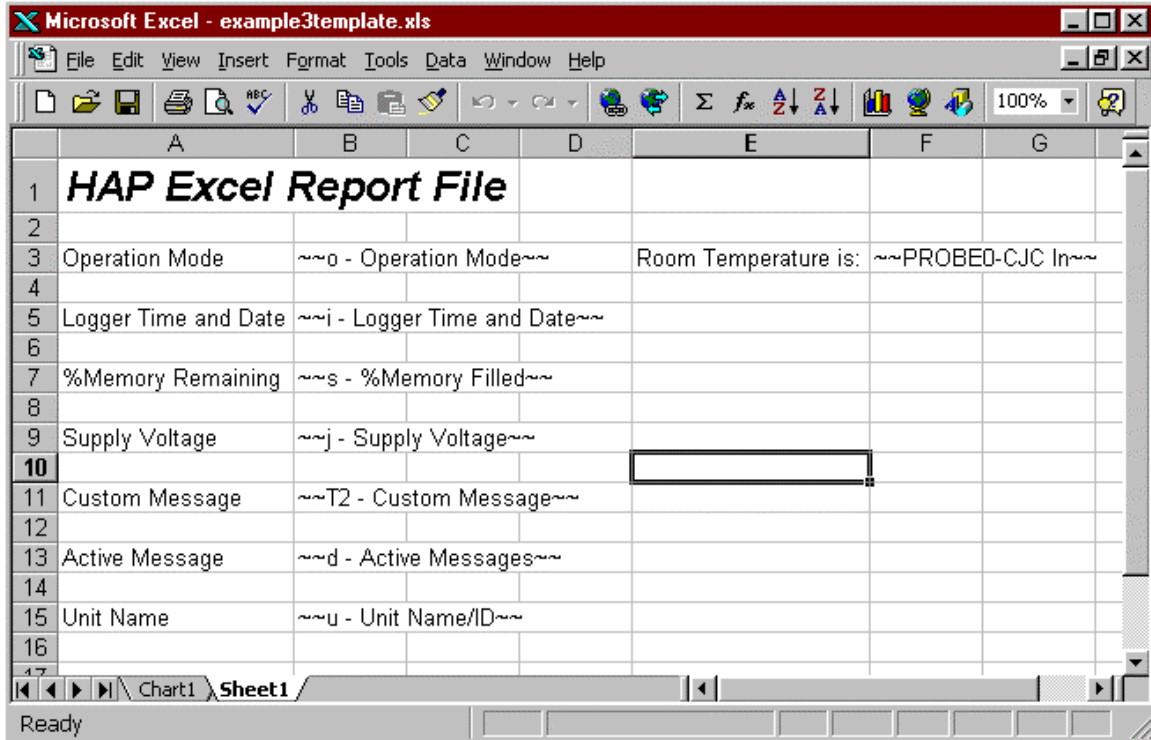


Figure 5.3.1c Excel Template File for HAP, Example 5.3

7) Save the file as “example3template.xls”. Exit Excel.

5.3.3) Enable AutoAnswer and process , example 5.3

1) Enable AutoAnswer.

2) Once the room warms to 80 degrees, HAP starts processing the Logger call. Figure 5.3.3a below illustrates HAP processing:

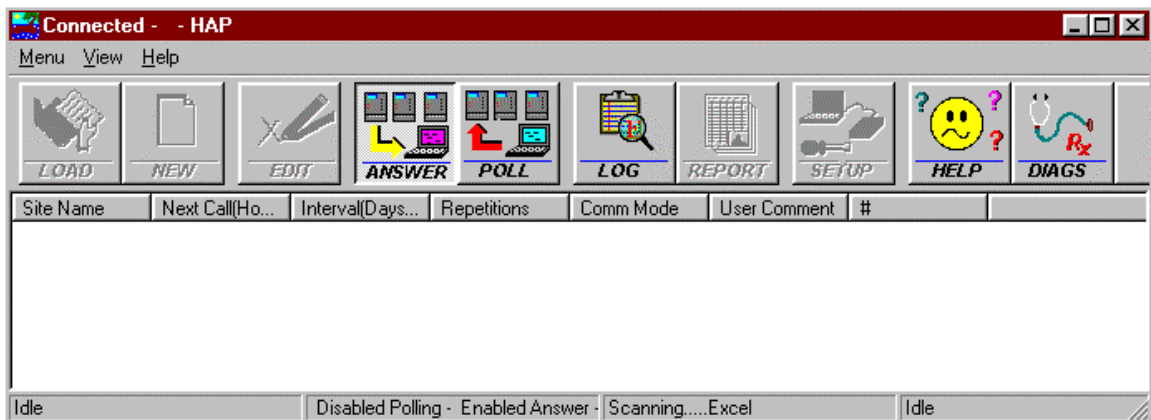


Figure 5.3.3a HAP processing AutoAnswer, Example 5.3

3) Once HAP completes processing, the popup message illustrated in figure 5.3b below appears:

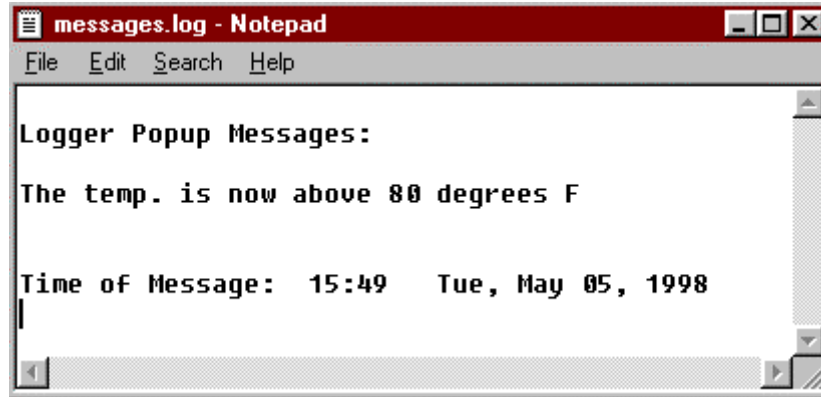


Figure 5.3.3b Popup message, Example 5.3

4) Check the log file by selecting “Log” from the main dialog. Figure 5.3.3c below illustrates the log file:

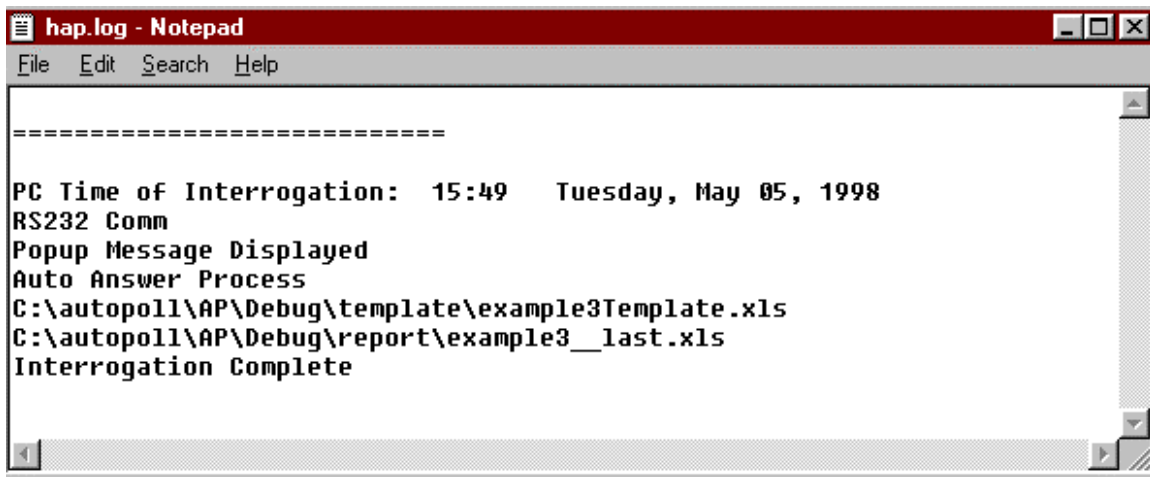


Figure 5.3.3c Log File, example 5.3

5.3.4) Checking the output , example 5.3

Figure 5.3.3c illustrates the file “example3__last.xls” was written. This file is the HAP generated report. HAP generated this file by using the template file “example3Template.xls”. During Logger interrogation, HAP scans the template file for Logger commands. HAP interrogates the Logger and then deposits the result in the report file “example3__last.xls”. Figure 5.3.4 below illustrates “example3__last.xls”:

The screenshot shows a Microsoft Excel window titled "Microsoft Excel - example3_last.xls". The spreadsheet contains the following data:

	A	B	E	F
1	HAP Excel Report File			
2				
3	Operation Mode	Executing RUN Program	Room Temperature is:	80.987 F
4				
5	Logger Time and Date	5/5/98 16:21		
6				
7	%Memory Remaining	99		
8		1		
9	Supply Voltage	14.4 VDC		
10		GOOD		
11	Custom Message	The temp. is now above 80 degrees F		
12				
13	Active Message			
14				
15	Unit Name	HL		
16		HyperLogger		
17				

Figure 5.3.4 Excel Report File generated by HAP, Example 5.3

6 For Your Information

6.1) Excel macro writing for report. Use of Master Mac.

Every time a HAP initiated Microsoft Excel report gets generated, the Macro “MasterMac” is executed. When the report is generated, HAP installs “Master Mac” in the Excel report file and executes the Macro. You may modify “Master Mac” by editing the “MasterMac” Macro in the Excel Template file used by HAP during report generation. Illustrated below is “MasterMac” with a print report Macro already installed. “User1” and “User2” are Macros installed by the you. User1 and User2 popup a message box indicating that Macro has been called.

```
Sub MasterMac()  
    ActiveWindow.SelectedSheets.PrintOut Copies:=1  
  
    'Call the user macros here  
    User1  
    User2  
End Sub  
  
Sub User1  
    MsgBox (“This is User1 Macro”)  
End Sub  
  
Sub User2  
    MsgBox(“This is User2 Macro”)  
End Sub
```

6.2)Excel Report Automatic Calculations

Performing automatic calculations in Excel is easy. To perform an automatic calculations on the HAP generated Excel report file, modify the Excel Template file. The illustration below illustrates an average calculation installed into cell A9 in a Excel Worksheet:

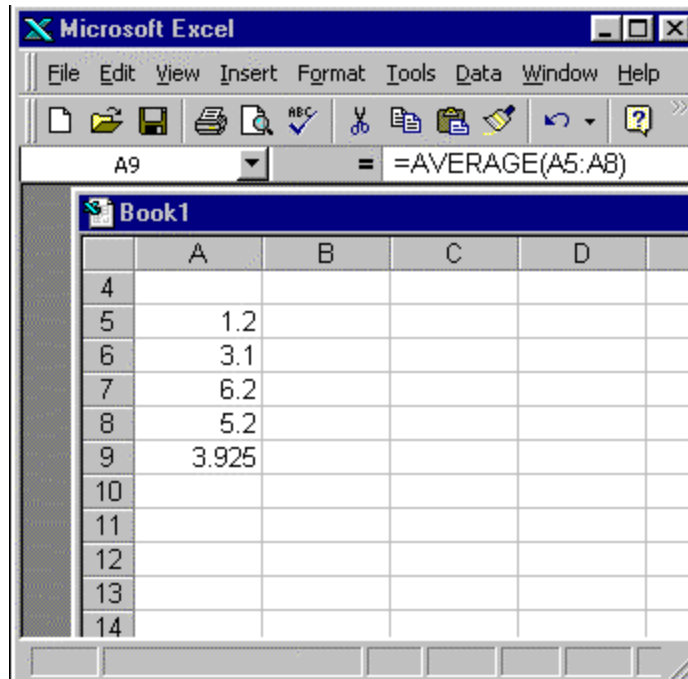


Figure 6.1 - Excel Worksheet with Calculation

6.3) Comm port AutoAnswer tie up.

When HAP is executing with Auto-Answer enabled, the Comm port configured in the “Setup Dialog” is busy. HAP opens the comm port and is idle waiting for a Logger to initiate communication. Other applications may not use the same comm port HAP has opened.

6.4) Using AutoAnswer and AutoPoll at the same time.

Auto-Answer and Auto-Poll may be enabled at the same time. If the PC receives a call from the Logger and Auto-Poll requires an interrogation, the Auto-Poll interrogation is delayed until Auto-Answer is finished. If Auto-Poll is interrogating a Logger and a Logger is trying to initiate a Auto-Answer, the calling Logger receives a busy signal and the Auto-Answer is not processed.

6.5) Can't run more than one copy of HAP

Only one copy of HAP may execute on a PC at a time. HAP senses if more than one copy is running, and denies access to the second copy.

6.5) How HAP operates in background

Once Auto-Answer or Auto-Poll are enabled HAP may be minimized. Other Windows application may be executing with HAP minimized and processing in AutoPoll or AutoAnswer enabled.

6.6) Logger Memory Modes -

Omega Engineering Inc. loggers have 3 memory modes

- 1) Log to Full Memory and Stop processing - Stops the loggers net program after memory is full.
- 2) Log to Full Memory and Continue processing - Continues processing after memory is full, but no additional samples are replaced in memory.
- 3) Rotary Memory - Once memory is filled, the additional samples are then added to memory by replacing the most historical sample. This memory mode works much like a ring buffer.

HAP supports all 3 memory modes. If memory is downloaded and you select the "Clear" command after file download the following events occur for each memory mode

- 1) Log to Full Memory and Stop - If the logger is not stopped, the memory is downloaded, the logger is cleared, processing then continues. If the logger is stopped, memory is downloaded, the Logger is cleared, and the Logger remains stopped.
- 2) Log to Full Memory and Continue Processing - Works the same way as Log to Full Memory and Stop but the Logger does not stop if the Memory is Filled. Once the Logger memory is filled and then downloaded and cleared, logging resumes to memory.
- 3) Rotary Memory - During memory download, the logger is stopped, memory is downloaded, memory is cleared, and the logger is restarted. Selecting the HAP "Clear" command for the logger has no affect on downloading memory.

6.7) A word about passwords

If the Logger contains a password, that password must be entered for that site during Auto-Poll site parameter configuration. If the Logger contains a password and the Logger initiates the interrogation (Auto-Answer), the user is not required to supply a password.

6.8) Using the Diagnostics Button

Figure 6.2 below illustrates HAP's diagnostics button. The diagnostics button is accessed from the main dialog. The diagnostics button is used to trouble shoot comm problems. Do not access diagnostics unless instructed to do so by a Omega Engineering Inc. technician.

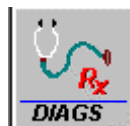


Figure 6.2 - HAP's Diagnostics Button

6.9) Server Busy Message

If a dialog opens indicating the “Server is Busy”, one of HAP’s clients is attempting to access a server that is locked. Attempt to satisfy the “Server is Busy” by closing all applications except HAP and selecting “OK” from the dialog. If you repeatedly get the “Server is Busy” dialog, re-booting Windows is necessary. The problem could also be with “Taskman”, see section 6.10 below.

6.10) Known problem with Taskman

Some copies of Windows cause execution problems with the HAP report generator. If you attempt to create an Excel Template from HAP and HAP the “Server is Busy” dialog opens, Taskman could be intercepting system messages. Taskman may be disabled. The work around is rename <Windows>Taskman.exe to another name or delete Taskman.exe. If you have this problem and are using Taskman.exe, contact Omega Engineering Inc.

6.11) Running Excel and editing the Template or Report file

If the HAP’s report generator and you are running Excel at the same time and editing the HAP Excel Template or Report generator file, the Excel report will not be generated. Excel does not permit the same file to be opened twice.

6.12) RS232 input signal grounding problems

Some RS232 comm ports are floating. If the comm port is floating and toggling between states, HAP encounters many events from the comm port. If this occurs, HAP’s Diagnostic Dialog is filled with RS232 events for those lines that are floating. If you are experiencing difficulty with RS232 communication contact Omega Engineering Inc. for further information and the fix.

Appendix A: Status Messages

The status messages are displayed at the bottom of HAP's main dialog.

HAP contains 4 separate areas for displaying status messages. The 4 areas from left to right consist of

- 1.) Comm Status
- 2.) Auto Poll/ Answer Status
- 3.) Logger Interrogation Status
- 4) Memory Data Download Progress - Indicates the progress of Logger Memory Download in percentage.

Possible Comm Status Messages include:

- 1) Opening Com Port
- 2) Resetting Modem
- 3) Initializing Modem
- 4) Modem Initialized
- 5) Dialing....
- 6) Waiting for Carrier Detect
- 7) Waiting for Modem OK
- 8) Verifying connection with Logger
- 9) Connection Complete
- 10) Idle

Possible Auto Poll/ Answer Status Messages include:

- 1) Idle
- 2) Enabled Polling
- 3) Disabled Polling
- 4) Enabled Answer
- 5) Disabled Answer

Possible Logger Interrogation Status Message include:

- 1) Logger Interrogation Error
- 2) Error Connecting to Logger
- 3) No Memory Data in Logger
- 4) Waiting For Connection
- 5) Connection Successful
- 6) Logger in Rotary Mode
- 7) Downloading Net Program
- 8) Downloading Data Memory
- 9) Stopping Logger
- 10) Clearing Data Memory
- 11) Restarting Logger
- 12) Shutting Down Interrogation
- 13) Interrogation Complete
- 14) Starting Report Generation
- 15) Scanning Report Template File

- 16) Sending Logger Value to Report
- 17) Writing Excel Report
- 18) Generation Report
- 19) Writing HLD File
- 20) Writing CSV File
- 21) Writing XLS File
- 22) Error in Post Processing
- 23) Post Processing Done
- 24) Idle
- 25) ERROR: Comm Timeout
- 26) ERROR: Interrogation Aborted
- 27) Idle-Auto Answer Complete
- 28) Idle-Auto Poll Complete
- 29) Idle-AA Abnormal Termination
- 30) Idle-AP Abnormal Termination
- 31) ERROR: Logger Requires Password - Idle
- 32) ERROR: An Unknown error - program download - Idle

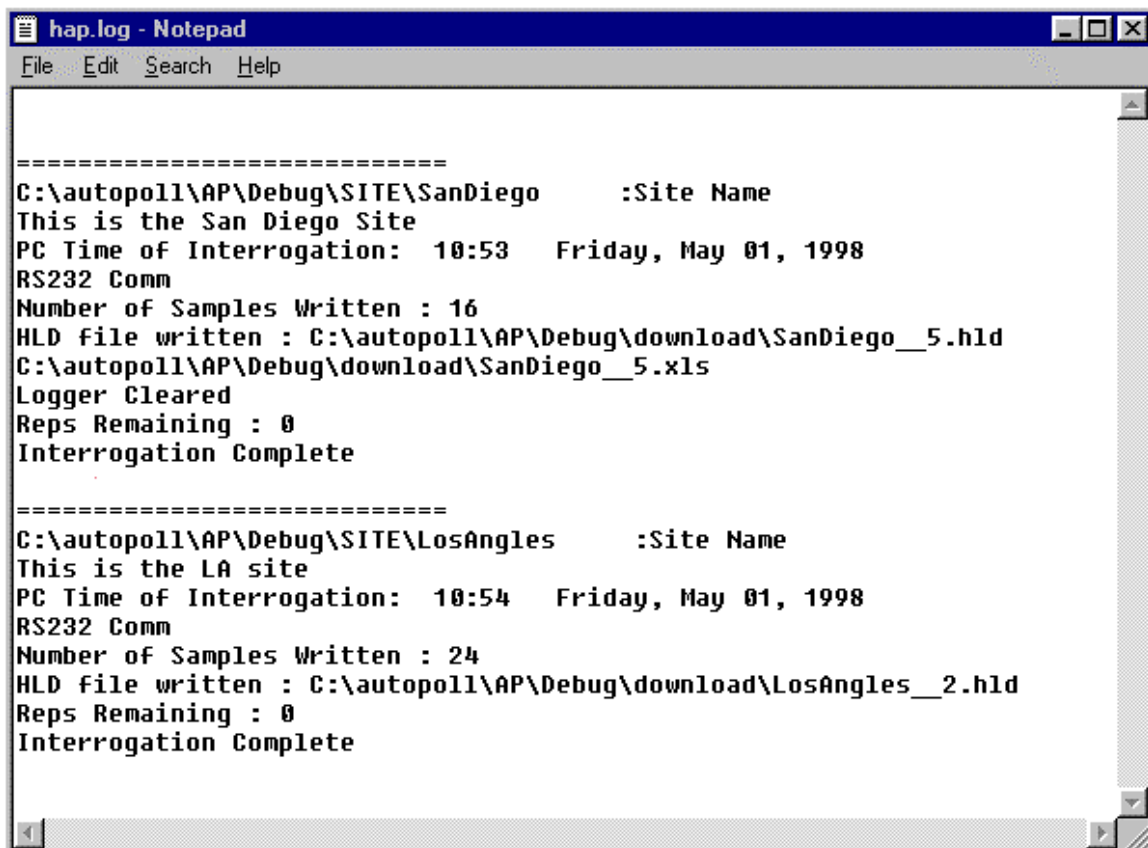
Appendix B: Log File Messages

The HAP log file is used to track logger interrogation progress. Log File messages are displayed by selecting the “Log” button from HAP’s main dialog:



Figure 4.5a Log Button on HAP’s Main Dialog

Selecting the “Log” button launches Microsoft Notepad with a copy of hap.log in Notepad’s editor:



```
=====  
C:\autopoll\AP\Debug\SITE\SanDiego      :Site Name  
This is the San Diego Site  
PC Time of Interrogation:  10:53   Friday, May 01, 1998  
RS232 Comm  
Number of Samples Written : 16  
HLD file written : C:\autopoll\AP\Debug\download\SanDiego__5.hld  
C:\autopoll\AP\Debug\download\SanDiego__5.xls  
Logger Cleared  
Reps Remaining : 0  
Interrogation Complete  
  
=====  
C:\autopoll\AP\Debug\SITE\LosAngles      :Site Name  
This is the LA site  
PC Time of Interrogation:  10:54   Friday, May 01, 1998  
RS232 Comm  
Number of Samples Written : 24  
HLD file written : C:\autopoll\AP\Debug\download\LosAngles__2.hld  
Reps Remaining : 0  
Interrogation Complete
```

Figure 4.5b Displayed Log File

Figure 4.5b above illustrates the Log File that results in polling two sites; SanDiego and LosAngles. This log file shows the site name, site user comment, time of interrogation, comm mode, number of samples written, files written during the poll, repetitions, and “Interrogation Complete”. The “Interrogation Complete” message indicates no errors occurred during interrogation.

Messages in the Logger can consist of filename written to disk, some of the site parameters, and the following messages:

- 1) Site Name including path is site file

- 2) User Comment
- 3) Comm Mode
- 4) PC Time of Interrogation
- 5) Interrogation Complete
- 6) User Initiated Premature Termination
- 7) Abnormal Termination
- 8) Number of Samples Written
- 9) Reps Remaining
- 10) WARNING: No Samples in Logger
- 11) Number of Samples Written
- 12) HLD file written
- 13) Reps Remaining
- 14) Auto Answer Process
- 15) ERROR: Opening Comm Port - Abort
- 16) ERROR: Opening Comm Port 'Timeout' - Abort"
- 17) ERROR: Comm Modem Reset - Abort";
- 18) ERROR: Comm Modem InitString - Abort"
- 19) ERROR: Comm Modem InitString 'OK' - Aborting"
- 20) ERROR: Comm Sending Logger Verification - Abort
- 21) ERROR: Comm Timeout waiting for verification from Logger - Abort
- 22) ERROR: Logger Requires a Password
- 23) ERROR GP - UNKNOWN - Aborting
- 24) ERROR Incorrect Password for logger
- 25) ERROR Password Match - Aborting
- 26) COMM Connection ERROR - Aborting Interrogation
- 27) ERROR - Getting Logger ID - Aborting
- 28) ERROR - Getting Logger Time - Aborting
- 29) ERROR - Getting Logger Current Time - Aborting
- 30) ERROR: Net or Memory Download Timeout, Aborting..
- 31) WARNING: No Data in Logger
- 32) ERROR: Password required for Interrogation - Aborting
- 33) ERROR: An Unknown error occurred during Program download - Aborting
- 34) Logger in Rotary Mode
- 35) ERROR - Rotary Mode - Stop
- 36) ERROR - Stopping Logger
- 37) Logger Stopped
- 38) ERROR - Clearing Logger
- 39) Logger Cleared
- 40) ERROR - Enabling Logger
- 41) Logger Re-Started
- 42) Failed Connection to HAP Report
- 43) ERROR: Excel Template File not Found
- 44) ERROR: HAP failed to copy Excel template file to report file
- 45) ERROR - Getting Logger Probe Points
- 46) ERROR - Getting Logger Op Mode

- 47) ERROR - Getting Logger Active Messages
- 48) ERROR - Getting Logger Memory
- 49) ERROR - Getting Battery Voltage
- 50) ERROR - Getting Logger HAP CMD Word - Aborting
- 51) ERROR - Getting HAP Popup Message - Aborting
- 52) ERROR - Getting Logger HAP Rep Template Name - Aborting
- 53) ERROR - Getting Logger HAP Report Name - Aborting
- 54) ERROR - Getting Logger HAP Download File Name - Aborting
- 55) ERROR - Getting Logger HAP ICON - Aborting
- 56) ERROR - Logger - Getting Password - Aborting
- 57) ERROR: There is a Password in Logger - Aborting
- 58) Popup Message Displayed

Appendix C: Directory Structure

HAP creates a default directory structure for polling files, site files, report files, template files, and downloaded memory data files. If HAP is installed in the directory <HAP> the default directories are:

- 1) Polling files: <HAP>\polling
- 2) Site files: <HAP>\site
- 3) Report files (XLS): <HAP>\report
- 4) Template files (XLS): <HAP>\template
- 5) Downloaded data files (HLD, CSV, and XLS): <HAP>\download

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