

PAS

Power Analysis Software for Windows

Version 1.2.5

Getting Started

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Introduction

The following paragraphs outline some of the differences between this version of PAS in comparison to previous versions you may have used.

Installation

If you install the new PAS into the same directory where your current version of PAS is installed, it is recommended that you do not uninstall your old PAS before installing this version; otherwise, your present PAS configuration database will be destroyed. Your current configuration database and all data files you have are still functional in the new PAS.

File Formats

Although PAS allows you to open ASCII log files created by previous PAS versions, and even to store data from the screen to ASCII files, most new features will only use the Microsoft Access .mdb database format. This format allows you to store different types of logs to a single database as separate tables, and makes it easy to transport your databases onto other PCs.

Automatic Data Retrieving

PAS allows you to retrieve all data logs from your meters at once and store them to a database, either on demand or on a time basis (e.g., daily or weekly) using a predefined schedule.

Embedded Communication Test

PAS incorporates the test features that were previously included in the DOS-based PComTest program, allowing you to test communication with your meters.

Preprogrammed Data Sets

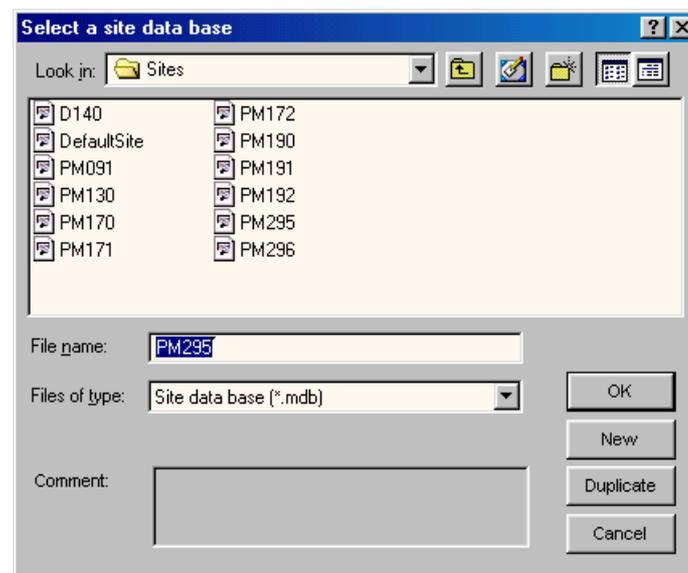
Any data sets you have prepared for the RT Data Monitor and RT Min/Max Log are still functional in the new PAS, although they need to undergo a simple procedure before you can use them: open the Data Set dialog and scroll through all active data sets, and then save them. Perform this procedure for both the RT Data Monitor and RT Min/Max Log.

Communicating with Your Meters

Creating a New Site

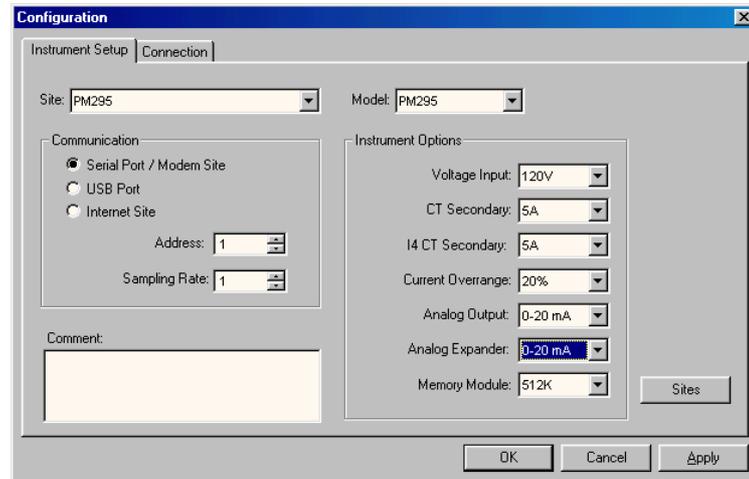
In order to communicate with your meters, you should create a separate site database for each one where all meter settings are stored. PAS keeps all site settings in a file with a name you give it and the extension .mdb. When you install PAS on your computer, a directory named "Sites" is created in the PAS installation directory. It is advised to keep all your site databases in this directory.

To create a new database for your meter, select 'Configuration' from the Tools menu, and then click 'Sites' at right on the 'Instrument Setup' tab. From the 'Look in' box, select the directory where a new database will be stored. Type a site name for your meter in the 'File name' box, click 'New', and then click 'OK'. You will see the selected site's name in the 'Site' box. As you create new databases, their names are added to the site list that you can browse from this box.



In the 'Model' box, select your meter model type, and in the 'Instrument Options' group boxes, specify the voltage and current input and analog output (if any)

options for your meter. If the meter has an onboard logging memory, select the correct memory module size for your meter.



You can add any comments to the 'Comments' box, such as meter location or any other data concerning this particular site.

Note You cannot change the site properties or communication settings when the 'On-line' button  on the toolbar is checked. Uncheck it before entering the 'Configuration' dialogs.

Setting up Communications

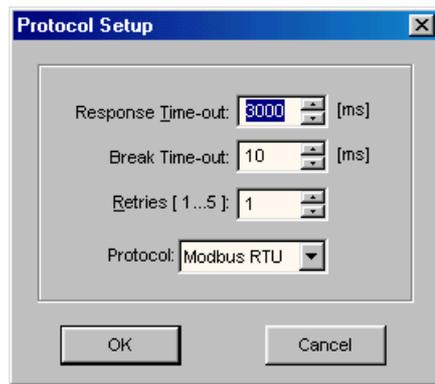
Your meters can be connected to a PC through serial communications (directly to your PC RS-232 port, via the RS-485 to RS-232 converter, or through a modem), the Internet (using the SATEC ETC-2002 Network Communicator), or the USB port.

To provide PAS with information on your meter location, select 'Configuration' from the 'Tools' menu. In the 'Communication' group on the 'Instrument Setup' tab, select the type of a connection for your meter, and set the device communication address you assigned to the meter. The 'Sampling Rate' box defines a rate at which PAS will update data on your screen when you continuously poll the meter in the PAS Data Monitor.

If you selected 'Serial Port/Modem Site', click on the 'Connection' tab to select a port on the PC through which PAS will communicate to your meter.

Selecting a Protocol for a Serial Port/Modem

On the 'Connection' tab, click on 'Protocol' and select the communications protocol as you have selected in your meter.



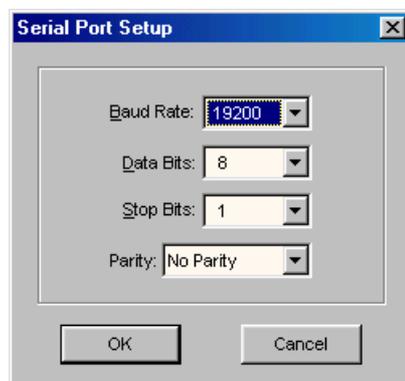
The remaining settings in this dialog do not normally need to be changed. The 'Response Time-out' box defines the maximum time in milliseconds that PAS will wait for the meter response before announcing a failure. When communicating through a modem, especially over long distances, this time may require some adjustment.

The 'Break Time-out' box defines the maximum idle time that PAS will wait after receiving the last message character to close a connection. This setting is important only when PAS is running the Modbus RTU or DNP3 protocol. It does not affect ASCII communications. The default value of 10 ms is usually sufficient for reliable communications, but it can be affected by the load on your PC. If there are many applications running on your PC, PAS might be prevented from responding to received characters fast enough, so it might close the communication while the meter is still transmitting its response message. If you frequently receive the message 'Communication failed', this could mean that 'Break Time-out' should be increased. Note that this time is added to the message transfer time, and increasing it excessively will slow communications.

The 'Retries' box defines the number of attempts that PAS will use to receive a response from the meter in the event the communication fails before announcing a communication failure.

Communicating through a Serial Port

On the 'Connection' tab, select from the 'Device' box a COM port and click on 'Configure' to specify the baud rate and data format for the port. Choose the same baud rate and data format as you have set in the meter, and then click 'OK'.



COMMUNICATING WITH YOUR METERS

Communicating through a Modem

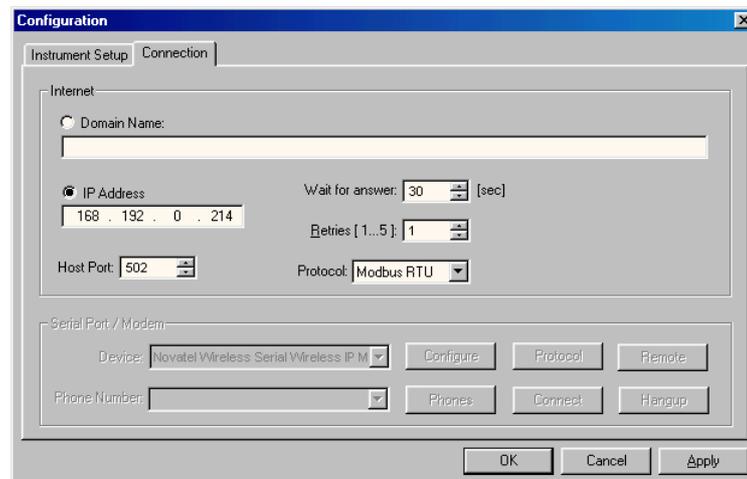
On the 'Connection' tab, select in the 'Device' box a local modem installed on your PC through which you will communicate to your meter. Click on 'Phones' to add the phone number of the remote modem to the phone list. Type the phone number in the 'Phone number' box, add comments if you desire, click 'Add', and then click 'OK'. In the 'Phone number' box on the 'Connection' pane, select the phone number from the list. Click 'OK'.

Communicating through Internet

Click on the 'Connection' tab. Click on the 'IP address' and type in the IP address of the ETC-2002 Network Communicator to which your meter is connected. In the 'Protocol' box, select communications protocol that you set in the meter. Type the TCP port number for your protocol in the 'Host Port' box. Use the following table to correctly select the TCP port for your protocol:

Modbus RTU	- 502
DNP3	- 20000
SATEC ASCII	- 5002

If you wish, adjust the time that PAS waits for a connection before announcing an error and the number of retries PAS will use to receive a response from the meter if communications fail.



Programming Your Meters

Creating Setups for Your Meters Off-Line

PAS allows you to prepare setup data for your meters off-line without the need to have the meter connected to your PC. You can save these data in the meter's site database, and then recall and download it to the meter when you have the meter on-line.

To prepare a setup for your meter, select a meter site from the list box on the toolbar, and then select the desired setup group from the 'Meter Setup' menu.

Click on the tab with the name of the setup you want to create and fill in the boxes with the desired configuration data for your meter.

Basic Configuration		Demand Setup	
Wiring Mode	4LN3	Power Demand Period [min]	15
PT Ratio	20.0	Number of Demand Periods	1
CT Primary Current [A]	400	Power Thermal Time Constant [sec]	195.4
I4 CT Primary Current [mA/A]	400	Volt/Ampere Demand Period [sec]	900
VDC Offset	0	Amp. Thermal Time Constant [sec]	390.9
VDC Full Scale	100		
Maximum Demand Load Current	0		
Nominal Frequency	50		
Averaging Buffer Size	8		
Enable/Disable Reset	Enable		

After you have completed the setup, click on the 'Save as...' button. The name of the selected site database appears in the 'File name' box by default. If you want to save your setup into another site database, select it from the file pane. Click on 'OK'.

Note PAS uses the Basic Setup data as a reference in all setup dialogs. Create the Basic Setup configuration for your meter first and save it to the site database before preparing other meter setups.

If you want to reuse setups from another site, you can simply copy setups from that site to your present site database. Click 'Open', select the desired site database, and then click 'OK'. The opened setup will be copied to your site database.

You can also copy all setups from one site database into another site's database. Select a meter site from the list box on the toolbar from which you want to reproduce setups, and then select 'Copy to...' from the 'Meter Setup' menu. Select the site database to which to copy setups from the present database, and then click 'OK'.

Downloading Setups to Your Meters

PAS allows you to update each setup in your meter one at time or to download all setups together from the site database.

To update a particular setup in your meter, check the 'On-line' button  on the toolbar, select a meter site from the list box on the toolbar, and then select the desired setup group from the 'Meter Setup' menu. Click on the pane with the name of the setup you want to download to the meter, and then click 'Send'.

To download all setups to your meter at once, check the 'On-line' button  on the toolbar, select a meter site from the list box on the toolbar, and then select 'Download Setups' from the 'Meter Setup' menu. Reply 'Yes' to the PAS warning message.

Uploading Setups from Your Meters

PAS allows you to update the site databases with the setups currently presented in your meters.

To upload the setups from the meter to the site database, check the 'On-line' button  on the toolbar, select a meter site from the list box on the toolbar, and then select 'Upload Setups' from the 'Meter Setup' menu. Reply 'Yes' to the PAS warning message.

Monitoring Your Meters

Viewing Real-time Data

Real-time data can be continuously retrieved from your meters and updated on the screen at a rate you defined in the Instrument Setup.

To poll your instrument, select a meter site from the list box on the toolbar, select 'RT Data Monitor' from the 'Monitor' menu, and then select a data set you want to view.

PAS supports 33 programmable data sets each consisting of up to 40 data parameters. Set 0 is intended for old SATEC meters, such as PM170, PM270, PM290, which have a limited number of parameters. To re-organize data sets, select 'Data Set' from the 'Monitor' menu or click on the button  on the toolbar. You will see some predefined data sets and others which are empty. You can freely modify both to organize data in sets that will be convenient for you to use.

Data Set

RT Data Set Definition

Set # REAL-TIME MEASUREMENTS

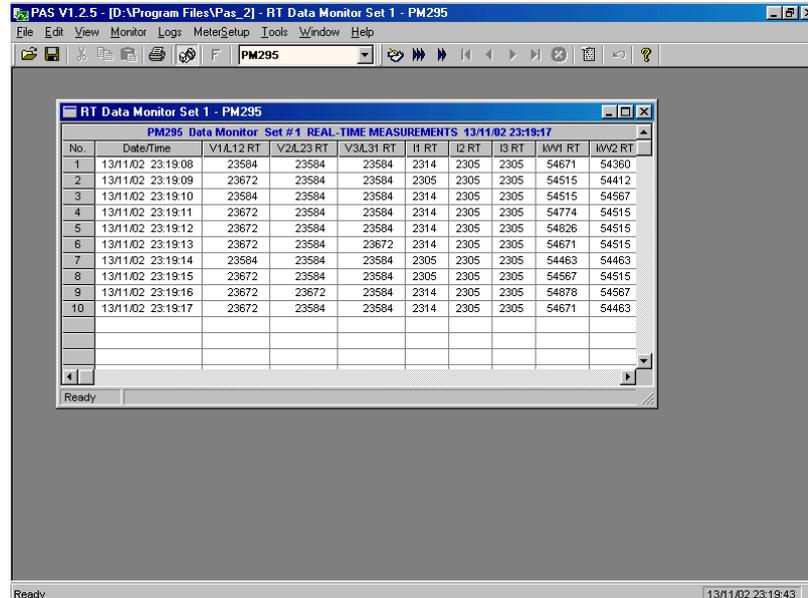
No.	Group	Parameter	No.	Group	Parameter
1	RT PHASE	V1L12 RT	21	RT PHASE	THD V3 RT
2	RT PHASE	V2L23 RT	22	RT PHASE	THD I1 RT
3	RT PHASE	V3L31 RT	23	RT PHASE	THD I2 RT
4	RT PHASE	I1 RT	24	RT PHASE	THD I3 RT
5	RT PHASE	I2 RT	25	RT PHASE	KF I1 RT
6	RT PHASE	I3 RT	26	RT PHASE	KF I2 RT
7	RT PHASE	IW1 RT	27	RT PHASE	KF I3 RT
8	RT PHASE	IW2 RT	28	RT TOTAL	IW TOT RT
9	RT PHASE	IW3 RT	29	RT TOTAL	kvar TOT RT
10	RT PHASE	kvar1 RT	30	RT TOTAL	kVA TOT RT
11	RT PHASE	kvar2 RT	31	RT TOTAL	PF TOT RT
12	RT PHASE	kvar3 RT	32	RT TOTAL	PF LG TOT RT
13	RT PHASE	kVA1 RT	33	RT TOTAL	PF LD TOT RT
14	RT PHASE	kVA2 RT	34	RT AUX	I4 RT
15	RT PHASE	kVA3 RT	35	RT AUX	In RT
16	RT PHASE	PF1 RT	36	RT AUX	FREQ RT
17	RT PHASE	PF2 RT	37	RT AUX	V UNB% RT
18	RT PHASE	PF3 RT	38	RT AUX	I UNB% RT
19	RT PHASE	THD V1 RT	39	NONE	NONE
20	RT PHASE	THD V2 RT	40	NONE	NONE

Clear Copy Paste

OK Cancel Apply

MONITORING YOUR METERS

To run data polling, check the 'On-line' button  on the toolbar, and then click on either the 'Single poll' button  or 'Continuous poll' button . When in continuous poll, you can stop it by clicking on the 'Stop' button .



You can open as many data monitor windows as you want, either for different sites, or for the same site using different data sets.

Note When you open a data monitor window, it is linked both to the current site and to the selected data set. If you select another site from the site list, this does not affect the open data monitor windows. They are still linked to the sites for which they were created.

Changing the Data View

PAS can display data in either a single record or multi-record view. To change the view, click with the right mouse button on the Data Monitor window and select either 'Wrap' to see a single record, or 'UnWrap' to go to the multi-record view.

Adjusting the Number of Rows in a Multi-Record View

Click with the right mouse button on the Data Monitor window and select 'Options'. Adjust the number of records you want to see in the window, and then click 'OK'. When the number of retrieved records exceeds the number of rows in the window, the window will scroll up so that older records will be erased.

Saving Data to a File

You can save retrieved data to a file for later analysis. Click on the 'Save' button . Select the type of a file in which you want to keep the data. The choices are the ASCII *.dtl file and the *.mdb database. The ASCII files can hold only data of one type, while the .mdb file can hold all types of data in a single database, both real-time and historical data.

MONITORING YOUR METERS

Select a directory where you want your log files to be kept. To avoid confusion, do not store data files into the 'Sites' directory where site databases are located.

Select an existing file or type the name for a new file, and then click 'Save'.

Printing Data to a Printer

To print retrieved data to a printer, click the print button  on the toolbar, select a printer and click 'OK'. If you want to check how your document appears on the printed page, select 'Print Preview' from the 'File' menu.

Copying Data to Another Application

You can copy the entire data table or a part of a table into the Clipboard or into another application such as Microsoft Excel or Word in order to prepare your report.

Click with the right mouse button on the Data Monitor window and choose 'Select All', or click on the upper-left corner of the data table (where the 'No.' label is displayed). Click with the right mouse button on the Data Monitor window again and choose 'Copy' or click the 'Copy' button  on the toolbar. Run an application to where you want to copy data, position cursor at the correct place, and then click the 'Paste' button  on the application's toolbar or select 'Paste' from the 'Edit' menu.

If you want only a part of data to be copied, select with the mouse cursor while holding the left mouse button the rows or columns in the table you want to copy, and then click the 'Copy' button  on the toolbar.

Real-time Data Logging

PAS allows you to log polled data records to a database automatically at the time it updates the Data Monitor window on the screen.

To setup the real-time logging options:

1. Open the Data Monitor window.
2. Click on the 'RT Logging On/Off'  button on the toolbar, or select 'RT Logging Options' from the 'Tools' menu.
3. Select an existing database, or type the name for a new database and select a directory where you want to save it.
4. Select the number of tables, and the number of records in each table you want recorded.
5. Adjust the file update rate for automatic recording. It must be a multiple of the sampling rate that you defined in the Instrument Setup dialog.
6. Click Save.

When you run real-time data polling, PAS automatically saves retrieved records to the database at the rate you specified. The 'RT Logging On/Off' button  on the toolbar should be checked all the time to allow PAS to perform logging. You can

suspend logging by un-checking this button, and then resume logging by checking it again.

Viewing Real-time Min/Max Log

To retrieve the real-time Min/Max log data from the meter, select a meter site from the list box on the toolbar, select 'RT Min/Max Log' from the 'Monitor' menu, and then select a data set you want to view.

PAS supports nine programmable data sets each consisting of up to 40 data parameters. To re-organize data sets, select 'Data Set' from the 'Monitor' menu or click the button  on the toolbar. You will see some predefined data sets and others being empty. You can freely modify both to organize data in sets that will be convenient for you to use.

To retrieve the selected Min/Max log data, check the 'On-line' button  on the toolbar, and then click on the 'Single poll' button .

You can save retrieved data to a file or print it in the same manner as described in the previous section.

Viewing Real-time Waveforms

To retrieve the real-time waveforms from the meter, select a meter site from the list box on the toolbar, and then select 'RT Waveform Monitor' from the 'Monitor' menu.

To run polling waveforms, check the 'On-line' button  on the toolbar, and then click on either the 'Single poll' button  or 'Continuous poll' button . When in continuous poll, you can stop it by clicking on the 'Stop' button .

By default, PAS retrieves six 4-cycle waveforms (V1-V3 and I1-I3) sampled at a rate of 128 samples per cycle. If you want to retrieve waveforms only for selected phases, select 'Customize' from the 'Tools' menu, click on the 'Preferences' tab, check phases you want polled, and then click 'OK'.

Retrieved waveforms can be viewed in different windows as overlapped or non-overlapped waveforms, as RMS cycle-by-cycle plot, or as a harmonic spectrum chart or table. For information on using different waveform views, see Chapter 5.

Updating the Clock in Your Meters

To update clock (RTC) in the meter, select a meter site from the list box on the toolbar, check the 'On-line' button  on the toolbar, and then select 'RTC' from the 'Monitor' menu.

The RTC dialog displays the current PC time and the time in the meter. To synchronize the meter clock with the PC time, click 'Set'.

Remote Relay Operations on Your Meters

To perform remote control operations on the relays, or to check their present status, select a meter site from the list box on the toolbar, check the 'On-line' button  on the toolbar, and then select 'Remote Control' from the 'Monitor' menu.

The dialog shows you present forced relay status. To force a relay to operate or release, select a command for the relay and click 'Send'.

Retrieving Historical Data from Your Meters

If your meter has on-board logging capabilities, you can retrieve the historical logs from the meter and save them to the database for later analysis. This can be done in two ways. The first is uploading historical data on demand at any time you need them. The second is using the upload scheduler that runs at predefined intervals on your schedule, for example, daily, weekly or monthly. Historical logs are stored as separate tables to the .mdb databases.

Uploading Historical Data on Demand

To retrieve the historical logs from your meter, select a meter site from the list box on the toolbar, check the 'On-line' button  on the toolbar, and then select 'Upload Logs' from the 'Logs' menu.

Click the 'Select logs' button, check boxes for logs you want to upload from the meter, and then click 'OK'.

Note If you leave the box named 'Do not scan entire file' checked with the PM171 or PM295 meters, PAS will retrieve only new records that have not yet been read. In the event the historical files have been read from another PC, PAS might skip the last read records and you will miss data. Check this box with caution only if you are sure that your meter may not be accessed from another PC.

Select an existing database, or type the name for a new database and select a directory where you want to save it, and then click 'OK'.

Using the Upload Scheduler

To setup the Upload Scheduler, select 'Upload Scheduler' from the 'Logs' menu.

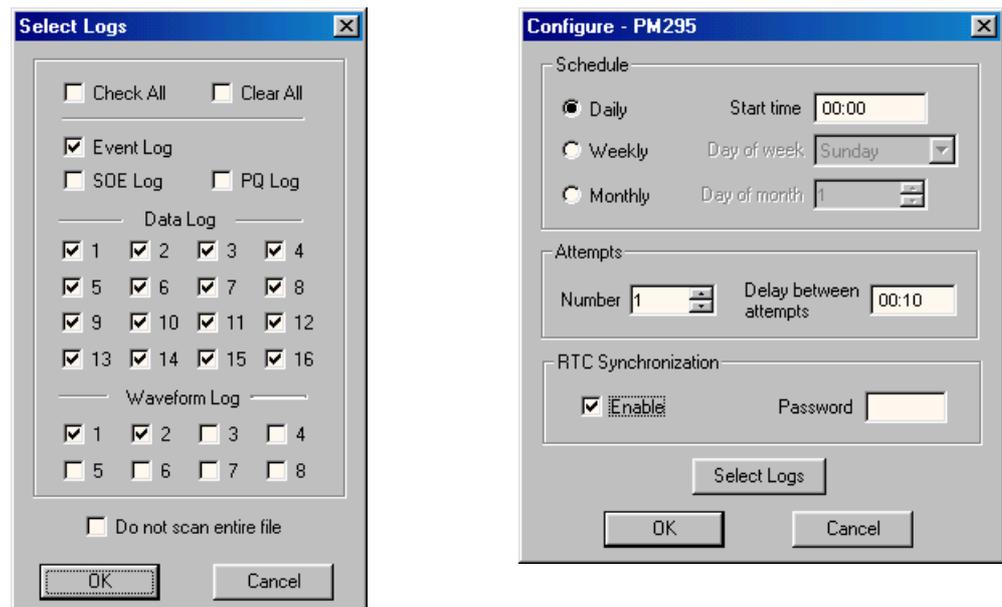
RETRIEVING HISTORICAL DATA

Adding a New Site to the Schedule

Click 'Add Site', select the site database for which you want to organize the schedule, and then click 'OK'.

Configuring a Schedule for the Meter

Click 'Configure' or double click with the left mouse button on the site row. Click on the 'Select logs' button, check boxes for logs you want to upload on a schedule from the meter, and then click 'OK'. Pay attention to the Note in the previous section.



Select a daily, weekly or monthly schedule, and adjust the start time for uploading. Select the number of attempts to upload data in the event of temporary communication problems or unavailability of your meter, and the delay between attempts in minutes and seconds.

If you want to use this schedule to synchronize the clock in the meter with the PC time, check the 'RTC Synchronization Enable' box. If your meter is secured by the communications password, type in the password you set in the meter to allow PAS to update the clock.

After you have configured a schedule for the site, click 'OK'.

Click 'Browse' at right and select an existing database for storing retrieved data, or type the name for a new database and select a directory where you want to save it, and then click 'OK'.

Activating a Schedule for the Meter

To activate a schedule for the meter, check the 'Enabled' box at left on the meter site row.

RETRIEVING HISTORICAL DATA

Keeping it running To keep the Upload Scheduler running, the 'On-line' button  on the toolbar must be checked all the time. If you uncheck it, the scheduler will stop operations. This will not cause loss of data, since the scheduler will resume operations when you check this button again.

Suspending the Scheduler

To suspend the Upload Scheduler, check the 'Suspend Scheduler' box at right. To activate the Upload Scheduler, leave this box unchecked.

Running the Scheduler on Demand

You can run the scheduler at any time outside the schedule by checking the 'Start Now' box at right. This is a one-time action. After uploading is completed, the Upload Scheduler will uncheck this box automatically.

Recording Upload Problems

When the Upload Scheduler fails to retrieve data from the meter, or some data is missing, or another problem occurs, it records an error message to the log file. To review this file, select 'Log Window' from the 'View' menu.

Viewing Historical Data On-line

Sometimes, it is useful to review a particular historical data on-line at the time you expect the new events to appear in the log. PAS allows you to retrieve historical data from a particular log without storing it to a file. The data appears only in the window on your screen. If you want, you can save it manually to the database.

To view a historical log on-line, select from the 'Logs' menu the log you want to retrieve, check the 'On-line' button  on the toolbar, and then click on the 'Single poll' button . Only new log records will be retrieved from the meter. If you want to review the log from the beginning, click on the 'Restore Log' button  on the toolbar, and then click on the 'Single poll' button .

There is a difference between retrieving waveform logs on-line and viewing waveforms from a file. The waveforms are read one record a time, so that a multi-record waveform series may not be viewed in this mode as a single waveform.

For information on using different log views, see Chapter 5, 'Viewing Log Files'.

Note If you decide to view historical data on-line, make sure you leave unchecked the box 'Do not scan entire file' in the 'Select Logs' dialog when configuring the automatic uploading (see Note in section 'Uploading Historical Data on Demand'); otherwise, you may discover that the last logs are missing from your log files.

Viewing Log Files

Data stored into data files can be viewed on the screen in different formats. You can see how they look on your screen and check different options by opening sample files you received with PAS. They are located on your disk in the 'Samples' directory under the PAS installation directory.

Opening a Log File

To open a log file, click on the 'Open' button  at left of the toolbar, or select 'Open...' from the 'File' menu. In the 'Files of type' box, select the type of files you want to view, enter the directory where your files are located and select a file you want to open. If this is an .mdb database, click once on the file name with the mouse to receive the database contents on the right pane, select a desired table from this pane, and then click 'Open'

The following operations are available in all log views regardless of the particular log you are viewing.

Exporting Data to Another Application

You can copy the entire data table or graph, or part of the data into the Clipboard or into another application such as Microsoft Excel or Word in order to expand your report.

Click with the right mouse button on the data window and choose 'Select All'. If your current view represents a table, click on the upper-left corner of the table (where the 'No.' label is commonly displayed). Click with the right mouse button on the window again and choose 'Copy' or click the 'Copy' button  on the toolbar. Run the application to which you want to copy data, position the cursor at the correct place, and then click the 'Paste' button  on the application's toolbar or select 'Paste' from the 'Edit' menu.

Saving Data to a File

To save data to a file, click on the 'Save' button . Select the type of a file in which you want to keep the data. The choices are commonly the ASCII file with a log-specific extension and the *.mdb database.

Select a directory where you want your log file to be stored. To avoid confusion, do not store data files into the 'Sites' directory where site databases are located.

VIEWING LOG FILES

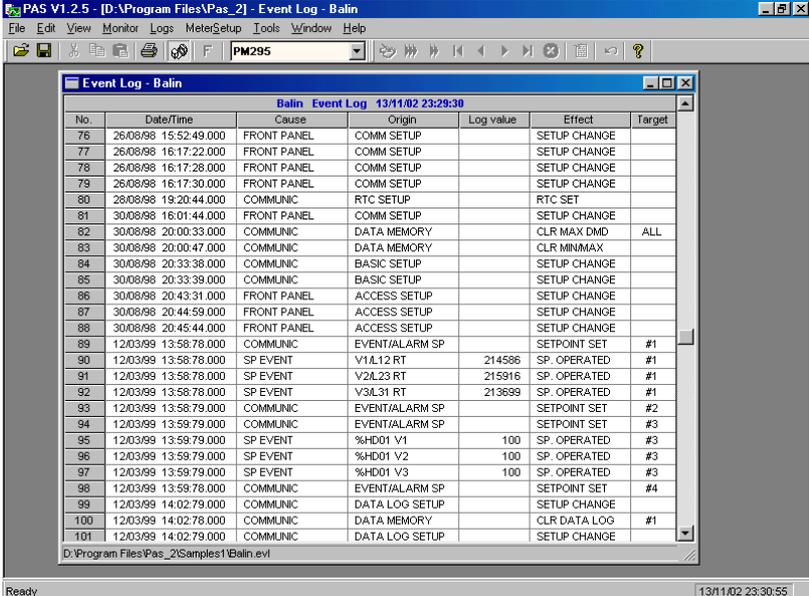
Select an existing file or type the name for a new file, and then click 'Save'.

Printing Data to a Printer

To print data to a printer, click the print button  on the toolbar, select a printer and click 'OK'. If you want to check how your document appears on the printed page, select 'Print Preview' from the 'File' menu.

Viewing the Event Log

Event log files are displayed in a tabular view, one event per row. PAS loads the entire log file (or database table) to a window, so that you can scroll through the entire log to view its contents.



The screenshot shows the 'Event Log - Balin' window in the PAS V1.2.5 application. The window title is 'PAS V1.2.5 - [D:\Program Files\Pas_2] - Event Log - Balin'. The menu bar includes 'File', 'Edit', 'View', 'Monitor', 'Logs', 'MeterSetup', 'Tools', 'Window', and 'Help'. The toolbar contains various icons, including a print icon. The main area displays a table with the following columns: No., Date/Time, Cause, Origin, Log value, Effect, and Target. The table contains 24 rows of event data, starting from 26/08/98 and ending at 12/03/99. The status bar at the bottom shows 'Ready' and the time '13/11/02 23:30:55'.

No.	Date/Time	Cause	Origin	Log value	Effect	Target
76	26/08/98 15:52:49.000	FRONT PANEL	COMM SETUP		SETUP CHANGE	
77	26/08/98 16:17:22.000	FRONT PANEL	COMM SETUP		SETUP CHANGE	
78	26/08/98 16:17:28.000	FRONT PANEL	COMM SETUP		SETUP CHANGE	
79	26/08/98 16:17:30.000	FRONT PANEL	COMM SETUP		SETUP CHANGE	
80	26/08/98 19:20:44.000	COMMUNIC	RTC SETUP		RTC SET	
81	30/08/98 16:01:44.000	FRONT PANEL	COMM SETUP		SETUP CHANGE	
82	30/08/98 20:00:33.000	COMMUNIC	DATA MEMORY		CLR MAX DMD	ALL
83	30/08/98 20:00:47.000	COMMUNIC	DATA MEMORY		CLR MINMAX	
84	30/08/98 20:33:38.000	COMMUNIC	BASIC SETUP		SETUP CHANGE	
85	30/08/98 20:33:39.000	COMMUNIC	BASIC SETUP		SETUP CHANGE	
86	30/08/98 20:43:31.000	FRONT PANEL	ACCESS SETUP		SETUP CHANGE	
87	30/08/98 20:44:59.000	FRONT PANEL	ACCESS SETUP		SETUP CHANGE	
88	30/08/98 20:45:44.000	FRONT PANEL	ACCESS SETUP		SETUP CHANGE	
89	12/03/99 13:58:78.000	COMMUNIC	EVENT/ALARM SP		SETPOINT SET	#1
90	12/03/99 13:58:78.000	SP EVENT	V1L12 RT	214586	SP. OPERATED	#1
91	12/03/99 13:58:78.000	SP EVENT	V2L23 RT	215916	SP. OPERATED	#1
92	12/03/99 13:58:78.000	SP EVENT	V3L31 RT	213699	SP. OPERATED	#1
93	12/03/99 13:58:79.000	COMMUNIC	EVENT/ALARM SP		SETPOINT SET	#2
94	12/03/99 13:59:79.000	COMMUNIC	EVENT/ALARM SP		SETPOINT SET	#3
95	12/03/99 13:59:79.000	SP EVENT	%HD01 V1	100	SP. OPERATED	#3
96	12/03/99 13:59:79.000	SP EVENT	%HD01 V2	100	SP. OPERATED	#3
97	12/03/99 13:59:79.000	SP EVENT	%HD01 V3	100	SP. OPERATED	#3
98	12/03/99 13:59:78.000	COMMUNIC	EVENT/ALARM SP		SETPOINT SET	#4
99	12/03/99 14:02:79.000	COMMUNIC	DATA LOG SETUP		SETUP CHANGE	
100	12/03/99 14:02:78.000	COMMUNIC	DATA MEMORY		CLR DATA LOG	#1
101	12/03/99 14:02:79.000	COMMUNIC	DATA LOG SETUP		SETUP CHANGE	

Sorting Events

Normally, event records are shown in the order based on the date and time of the event appearance. PAS can rearrange records in the order based on a cause of the event, and then sort records within each group according to the event time. To change the sorting order, click with the right mouse button on the Event Log window, select 'Sort...', check a desired sort order, and then click 'OK'.

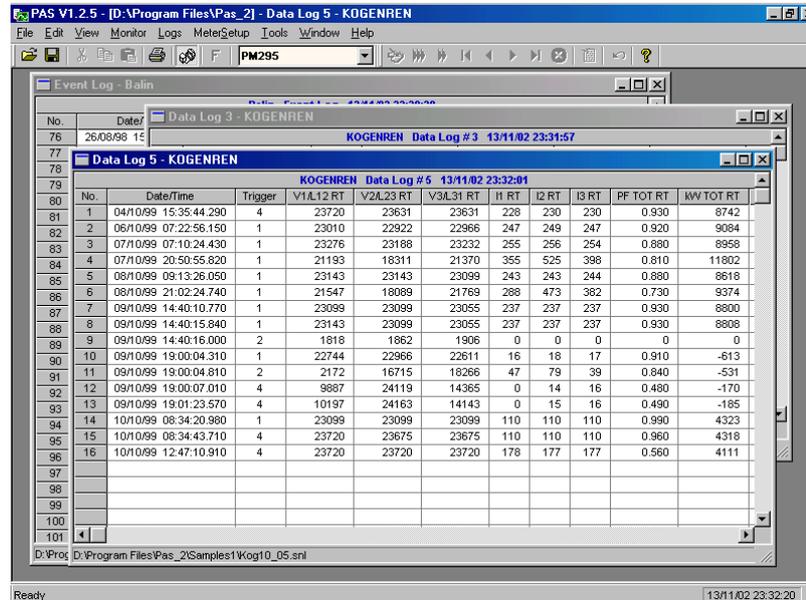
Filtering Events

The event log usually contains a large amount of records that concern events caused by different sources. You can use filtering to find and work with a subset of events that meet the criteria you specify. PAS will temporarily hide rows you do not want displayed. You can use a filter along with sorting to rearrange filtered records in the desired order.

To filter events, click with the right mouse button on the Event Log window, select 'Filter...', check the causes of events you want to display, and then click 'OK'.

Viewing the Data Log

Data log files are displayed in a tabular view, one data record per row. PAS loads the entire data log file (or database table) to a window. There are no any specific controls available for data log views.



Viewing the Waveform Log

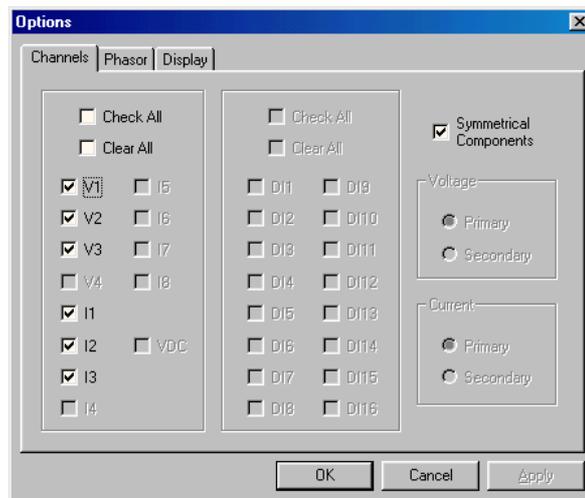
Waveform log data can be displayed in five different views. When you open a new file, PAS shows you a waveform graph with overlapped waveforms. Each waveform window has a local toolbar from where you can open another window for these waveforms to examine data in a different view. You can open all five views together to analyze different properties of the waveforms such as wave shape, disturbances, unbalance, or spectrum. When you move to another waveform record, all views are updated simultaneously to reflect the changes in the waveforms.

The status bar at the bottom of the waveform window shows you how many records the log file contains and the record number for the record currently displayed in the window. Use green arrowheads  on the PAS toolbar to move from a record to record.

Selecting Waveform Channels

A single waveform record can contain up to 25 waveforms including up to 8 AC channels (V1-V4, I1-I4 or I5-I8), one VDC channel and up to 16 digital channels, which you can see all together in a non-overlapped waveform view. Other waveform views may offer you fewer channels, or sometimes only a single channel.

VIEWING LOG FILES

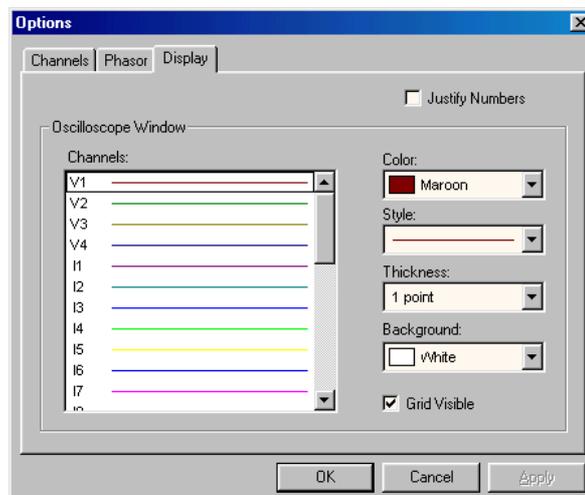


If you do not want to view all waveforms together on one screen, you can use filtering to work with a subset of waveforms that meet your criteria. PAS will temporarily hide waveforms you do not want displayed. To select desired waveform channels, click with the right mouse button on the waveform window, select 'Options...!', check the channels you want displayed on the 'Channels' tab, and then click 'OK'.

Note Waveforms recorded by the PM295 and PM296 to the Waveform Log 2 at a rate of 128 samples per cycle may not be displayed all together in one waveform view. Only two waveforms related to the selected phase will be shown.

Customizing Line Colors and Styles

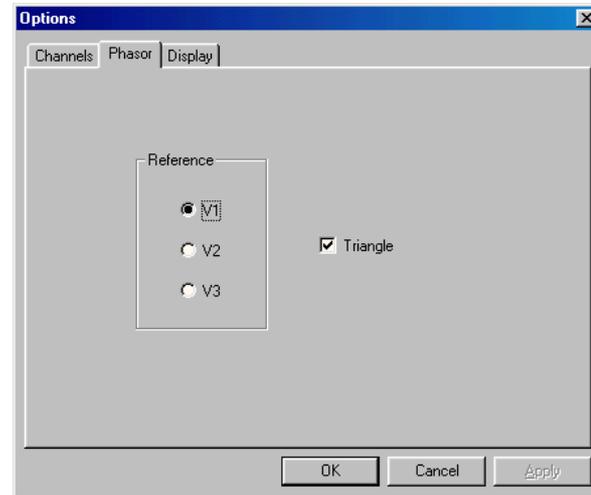
Waveforms for different channels can be shown in different colors using different line styles. To change the colors or line styles, click with the right mouse button on the waveform window, select 'Options...!', click on the 'Display' tab, adjust colors and styles for channels, and then click 'OK'. You can also change the colors for the waveform background and gridlines.



VIEWING LOG FILES

Viewing Phasor Diagrams

Waveform views have an additional pane at the lower right, where PAS draws phasor diagrams for displayed waveforms. The phasor diagrams show you the relative magnitude and angle of the fundamental harmonic for the selected voltage and current channels. All angles are taken relative to the reference voltage channel.



To change the reference channel, click with the right mouse button on the waveform window, select 'Options...', click on the 'Phasor' tab, check the channel you want to make a reference channel, and then click 'OK'. If you leave the 'Triangle' box checked, PAS will connect the ends of the voltage and current vectors by lines showing you tree-phase voltage and current triangles. This may be useful when analyzing voltage and current unbalances.

Phasor diagrams are calculated for one waveform cycle pointed to by the left marker line. As you move the marker, the phasor diagrams are updated reflecting the new marker position.

Viewing Symmetrical Components

Waveform views have an additional pane at the right where PAS can display the symmetrical components for voltages and currents, which are calculated for the point indicated by the left marker line. To enable or disable the symmetrical components, click with the right mouse button on the waveform window, select 'Options...', check or uncheck the symmetrical components on the 'Channels' tab, and then click 'OK'.

Selecting Primary and Secondary Units

Voltages and currents can be displayed in primary (default) or secondary units. To select primary or secondary units for your waveforms, click with the right mouse button on the waveform window, select 'Options...', select the desired units for voltages and currents on the 'Channels' tab, and then click 'OK'.

Note ASCII waveform files logged by previous releases of PAS do not contain information on the secondary voltage or current set in the waveform recorder. These waveforms will always shown in primary units.

VIEWING LOG FILES

Using the Marker Lines

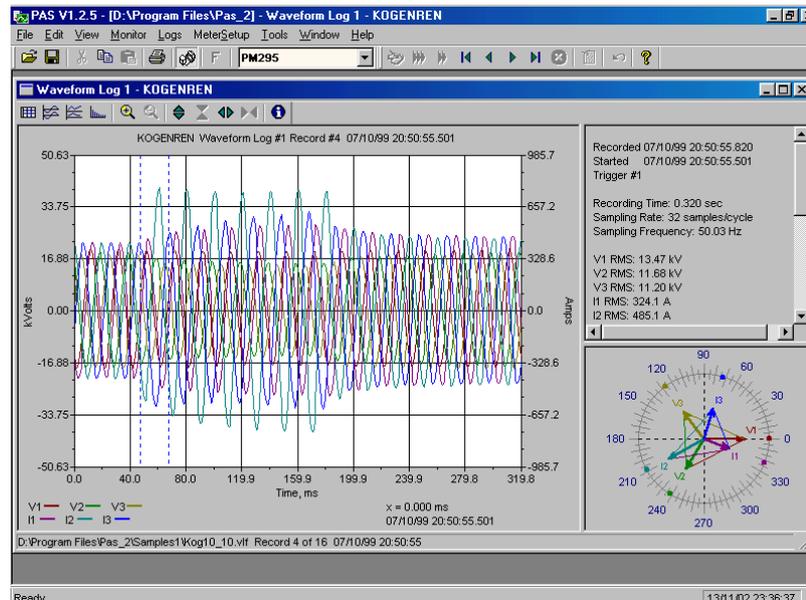
Waveform and RMS panes have two blue dashed marker lines. The left marker indicates the position from where data will be taken to calculate the harmonics spectrum and phasor diagrams, and also the starting position for calculating the RMS, average and peak values. The right marker indicates the end position for calculating the RMS, average and peak values. The minimum distance between the two markers is exactly one cycle.

To change the marker position, click with the right mouse button on the waveform window, select 'Set Marker', and then click with left mouse button on the point where you want to put the marker. You can also drag both markers with the mouse, or use the right and left arrow keys on your keyboard to change the marker position. Before using the keyboard, click on the waveform pane with the mouse, to allow the keyboard to get your input.

Using a Zoom

You can use a horizontal and a vertical zoom to change size of your waveforms. Use the buttons  on your local toolbar representing green arrowheads to zoom in or out of the waveform graph. Every click on these buttons gives you a 100-percent horizontal or 50-percent vertical zoom. Two buttons  representing a magnifying glass give you a proportional zoom in both directions.

When in the overlapped waveform view, you can zoom in on a selected waveform region. Click with the right mouse button on the waveform window, click 'Zoom', point onto one of the corners of the region you want to zoom in, press and hold the left mouse button, then point to another corner of the selected region and release the mouse button.

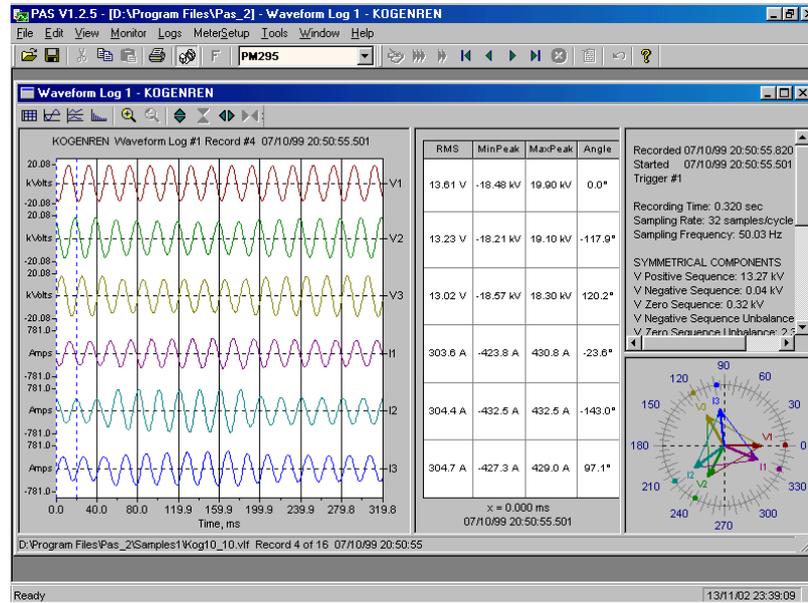


Viewing Waveforms

Waveforms can be displayed in two views: overlapped and non-overlapped. To select the first view, click on the button  representing a single waveform on the

VIEWING LOG FILES

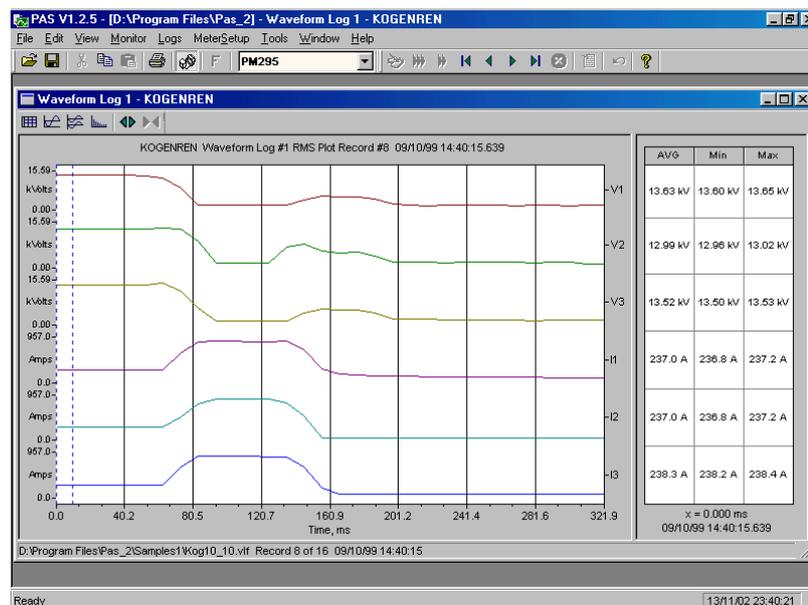
local toolbar; to select a non-overlapped view, click on the button  showing two waveforms.



Waveform data are recorded to files in series that may contain many cycles of the sampled waveforms. A waveform window can display up to 64 waveform cycles. If the waveform contains more than 64 cycles, the scroll bar appears under the waveform pane allowing you to scroll through the entire waveform.

Viewing an RMS Plot

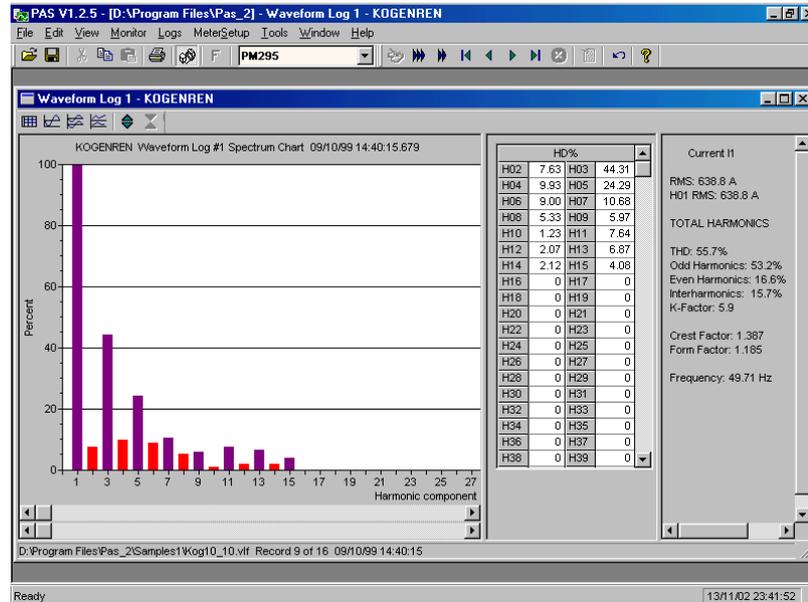
PAS can show you the cycle-by-cycle RMS plot of the sampled AC waveforms. To open the RMS view, click on the button  representing two curves above horizontal axes. The RMS view displays the RMS measured over one cycle and updated each half cycle of the sampled waveforms as per IEC 61000-4.



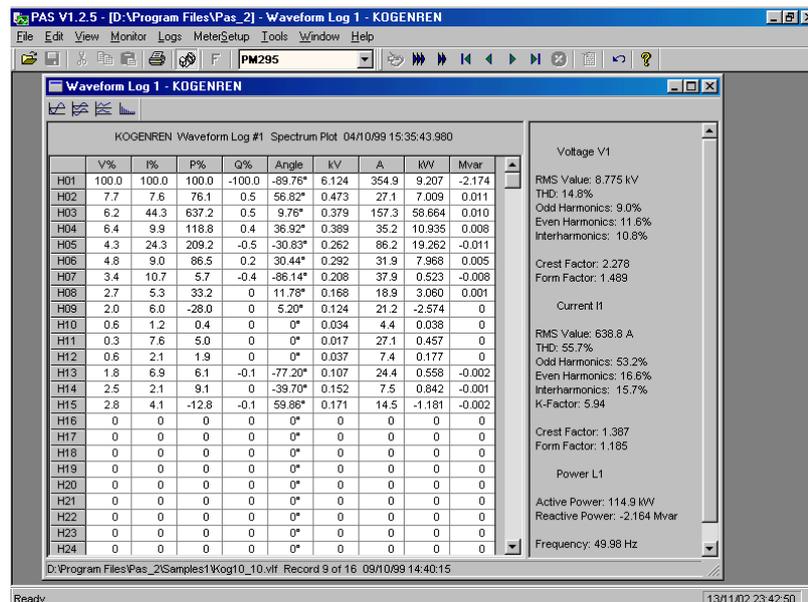
VIEWING LOG FILES

Viewing a Spectrum Chart

To view the spectrum chart for the selected waveform channel, click on the button  representing a spectrum graph. The spectrum is calculated over four cycles of the selected waveform beginning from the point where the left marker line is located in the open waveform view. If both waveform views are open, PAS gives the priority to the overlapped waveform view.



The highest number of the spectrum harmonic that will be calculated is equal to the half sampling rate at which the waveforms were sampled minus one. For example, if the sampling made at a rate of 128 samples per cycle, 63 harmonics are available. With 32 samples per cycle, only 15 harmonics will be calculated, while others will be zeros.



VIEWING LOG FILES

Viewing a Spectrum Table

To view the harmonics spectrum in a table view, click on the button  on the local toolbar. PAS allows you to view either a spectrum table for the selected channel, or all channels (V1-V3 and I1-I3) in a single table. Refer to section 'Selecting Waveform Channels' above for instructions on how to select waveform channels.

Customizing Your Views

Customizing Date Format

To change the way PAS displays the date, select 'Customize' from the 'Tools' menu, click on the 'Preferences' tab, select the preferred date order, and then click 'OK'.

Customizing Timestamp

The timestamp is normally recorded in the data log files and displayed on the screen at a 1-ms resolution. If you have an application that does not support this format, you can instruct PAS to drop the milliseconds.

To change the way PAS records and displays the timestamp, select 'Customize' from the 'Tools' menu, click on the 'Preferences' tab, select the preferred timestamp format, and then click 'OK'.

Selecting Voltage Disturbance Units

When programming a voltage disturbance trigger in your meter, the operate limit for the trigger can be set as a percent of the nominal voltage, in RMS units or in amplitude units.

To change the disturbance units, select 'Customize' from the 'Tools' menu, click on the 'Preferences' tab, select the preferred units, and then click 'OK'.