Home

California Instruments

PGUI or PGUI32
TRAINING MANUAL

P Series, RP Series
Graphical User Interface
Software

1251RP Programmable AC Source

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1. Introduction

This training manual was designed to help a new user of California Instruments‘ P or RP Series AC power sources become familiar with the operation of the PGUI / PGUI32 Graphical User Interface software. This program is included with the interface option for this product line.

To work through this training manual, it may be useful to have an actual AC source connected to the PC. This is not required however as the PGUI / PGUI32 will operate in simulation mode in the absence of a connection to an AC source. In the remainder of this training manual, the term PGUI will be used to denote both the PGUI (16 bit) and the PGUI32 (32 bit) version of this program.

1.1 Program Purpose

The PGUI can be used to control all aspects of the AC power source over the IEEE-488 bus (RP Series only) or RS232C (all models). This allows full PC control without the need to use the front panel of the instrument. The PGUI automatically adjusts to the connected AC Source configuration.

The PGUI is **NOT** a replacement for a custom Automated Test program that requires the use of multiple IEEE-488 or VXI based instruments. This program only operates a single AC source and will ignore all other types of instruments connected to the same bus. It is possible however for other Windows programs to run at the same time as the PGUI and control other instruments. If your application requires an integrated test program involving multiple instruments from different vendors, we suggest you consider developing your own software. Instrument drivers for National Instruments LabView are available free of charge from California Instruments to support this effort.

1.2 Training Manual Purpose

This training manual serves as an introduction to the use of the PGUI program. It does not replace the on line help system included in the PGUI program. Not all aspects of the program’s operation are covered in this training manual.

You can work through this manual at your own pace by following the steps and examples used to point out the operation of various program aspects. It is important to have the program installed and available while working through this manual. The presence of an AC source is not required however.

First time users of the PGUI that need to control the AC source from a PC may find it useful to work through this training manual first. If you have not used the PGUI for a while and need to get back to it for a new project or requirement, you may also benefit from working through this manual as a refresher.

1.3 Requirements

In order to use the PGUI program, you will need the following hardware and software items. You will also have to install the PGUI software and any IEEE-488 interface driver software on your PC if you have an RP model and intend to use the IEEE-488 interface. All units can be operated over RS232C using an available PC com port.

- **PC running Windows 3.1® or Windows for Workgroups 3.11®.**

The PGUI is a 16 bit Windows program and will not operate under Windows NT® or any other true 32 bit operating system. The PC you plan to use should have enough CPU processing power and memory (DRAM) to run any of the Windows versions listed above. We recommend at least a 486 class PC with 8 Mbytes of RAM. The PGUI will run on 386 class PC's with as little as 4 Mbytes of RAM but performance will be less than satisfactory.

- **PC running Windows 95/98™ or Windows NT™.**

The 16 bit version, PGUI, will operate under Windows 95/98® as well. A 32 bit version of this program is available as well - PGUI32 - and is recommended for users of Windows 95/98. Users of Windows NT have to use the 32 bit PGUI32. The 16 bit program will not run under NT.

- **PC Based IEEE-488 Interface Controller.**

RP Series AC sources can be controlled remotely using either the IEEE-488 General Purpose Instrumentation Bus (GPIB) or an RS232C serial interface.

For IEEE-488 control, you will need to install a suitable National Instruments IEEE controller in your PC. Other vendor IEEE controller cards have not been tested with the PGUI and may not function.

One of the following IEEE controller cards is recommended:

National Instruments

- GPIB-PCII/IIA
- AT-GPIB/TNT
- PCMCIA-GPIB

Follow the manufacturer's instruction for card installation. Make sure to install both the hardware (controller card) and any software that is supplied with the card. If you do not, you will only be able to use the PGUI program in its simulation mode.

- **PGUI Program.**

Make sure you have the latest version of the PGUI for Windows®. If not, some of the features covered in this training manual may not be available to you. You can check your version by selecting the Help About menu which will show you the program's release number. The latest version is available from California Instruments' website at www.calinst.com. This manual was created using PGUI version 2.12 / PGUI32 version 1.00.

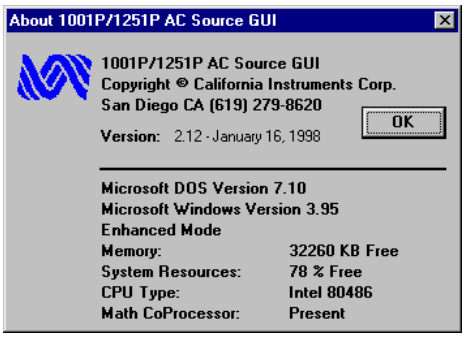


Figure 2 Version information PGUI 16 bit

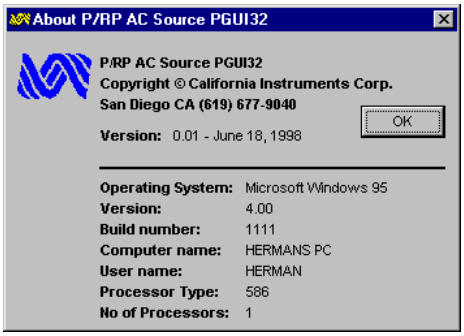


Figure 1 Version information PGUI32 32 bit

- **Supported AC Sources.**

  Supported models are :

P Series	RP Series
1001P	801RP
1251P	1251RP
	2001RP *(PGUI32 only)*

If you do not have one of these units connected to your PC or have a suitable interface in your PC yet, you can still proceed with this training session as the PGUI program will operate fully in simulation mode.

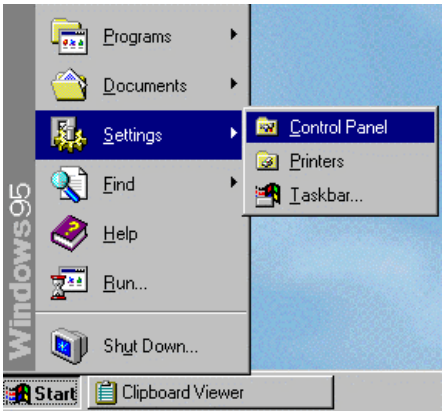
2.
PGUI Installation

This section covers installation of the AC source control software under Window 95®. If you are using Windows 3.1® or Windows for Workgroups 3.11®, the installation procedure is very similar except you use the Program Manager's File, Run menu to start the SETUP program located on the installation disk.

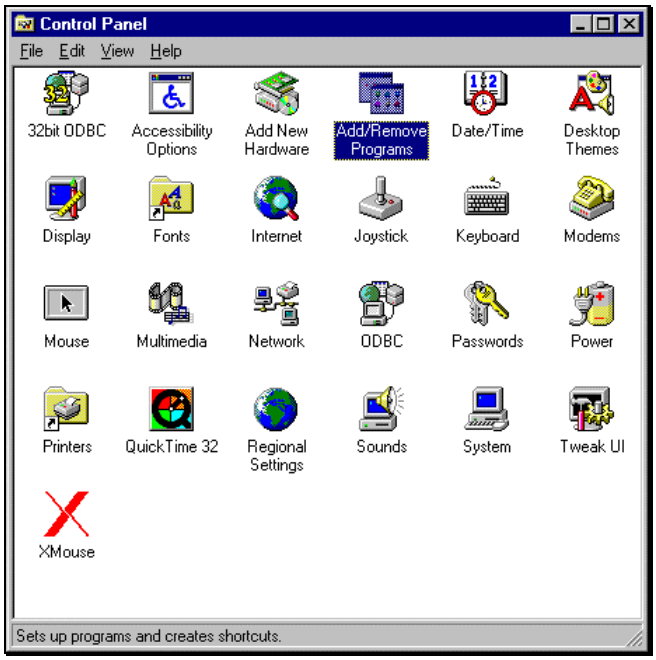
2.1 Windows 95® Installation procedure

To install the AC source control software under Windows 95®, proceed as follows:

1. From the Start menu, select **Settings**.

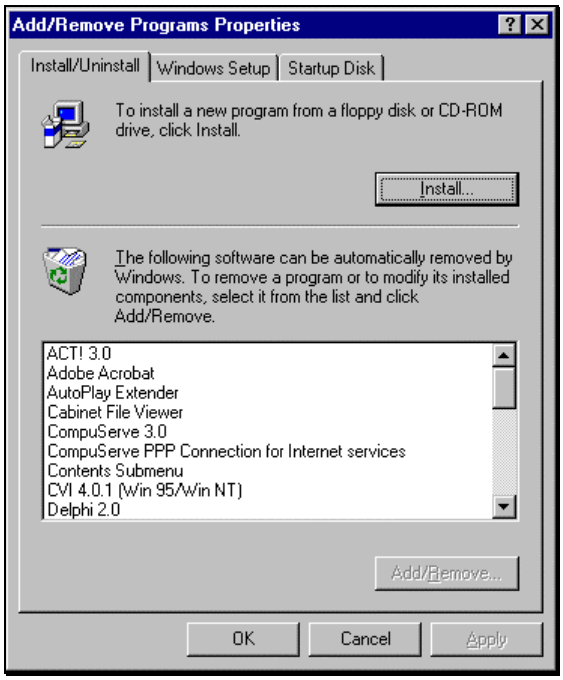


1. From the Settings options, select **Control Panel**

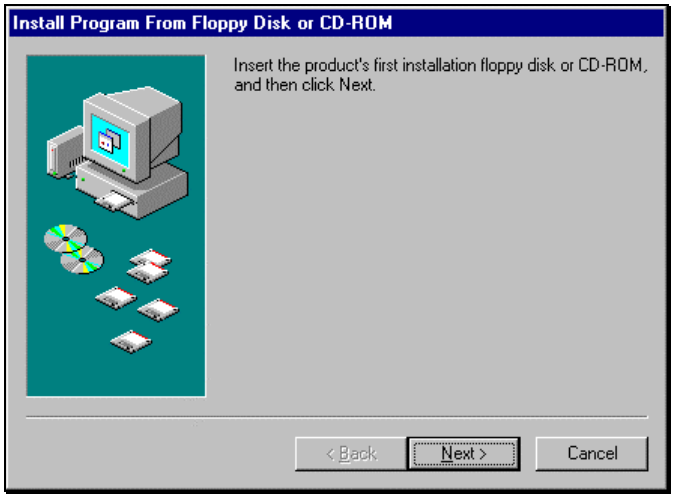


2. In the control panel folder, locate the **Add/Remove Programs** icon

3. Double click on the Add/Remove Programs icon to launch the Windows 95® Add/Remove Programs property dialog.

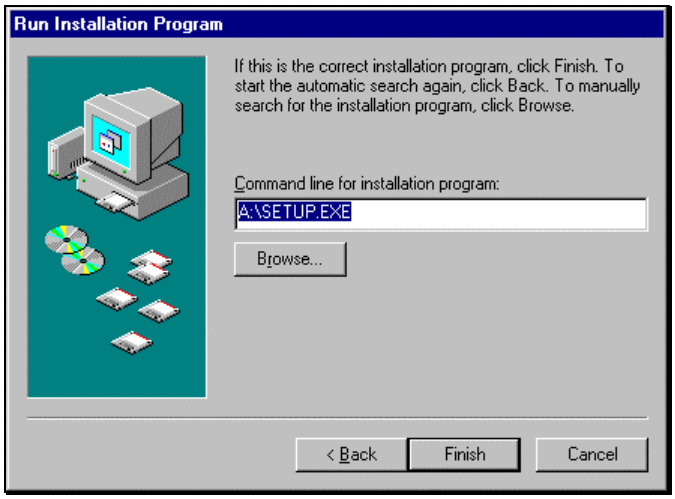


4. Click on the Install button located in the top right corner of this dialog box.



5. Insert the first installation disk in drive A and click on the Next button at the bottom of the dialog box.

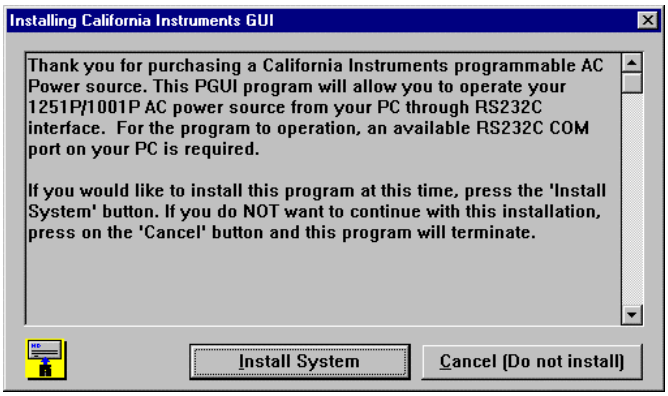
6. The program will locate the SETUP.EXE program on the first distribution disk and ask for confirmation.



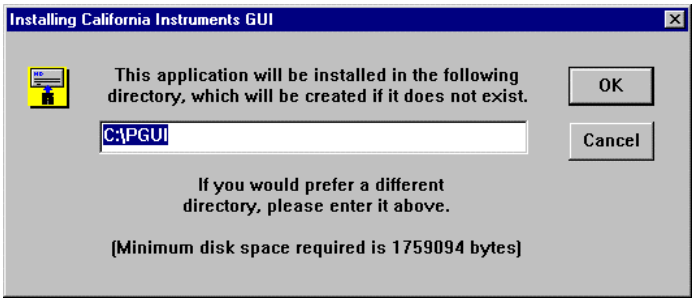
7. Click on Finish to start the installation process.

8. The setup program will now run and display a dialog box that shows the default directory for the AC source control software which is PGUI on the current drive. At this time you can accept the default directory by clicking on the OK button or enter a different directory. If the directory you enter does not already exist, it will be created.

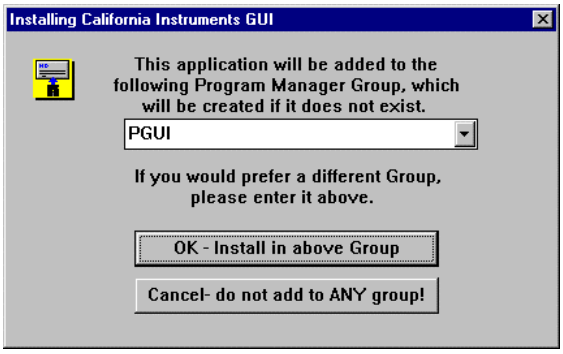
9. The setup program will now run and display a some information on the supported products and interfaces. If you do not want to install the program at this time, cancel the setup program by clicking on the Cancel button.



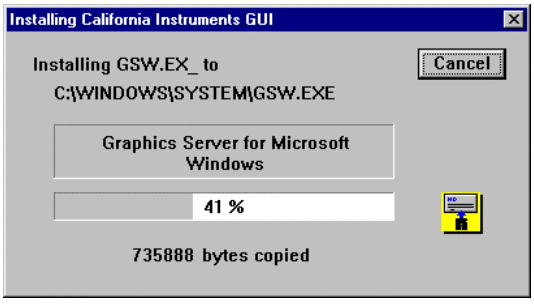
10. If you do want to install the program, click on Install System. A dialog box will appear next that shows the default directory for the AC Source Control software which is PGUI on the current drive. At this time you can accept the default directory by clicking on the OK button or enter a different directory. If the directory you enter does not already exist, it will be created.



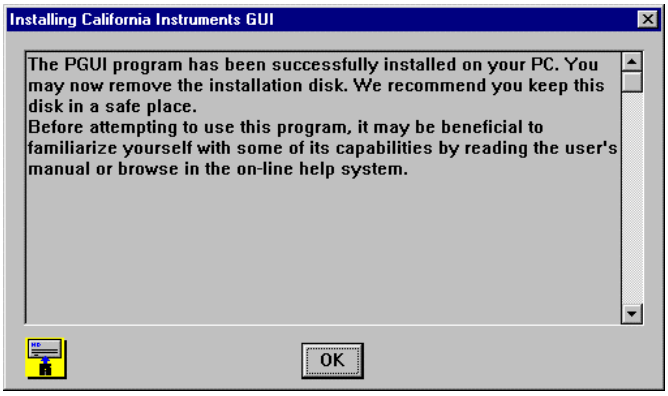
11. The setup program will create a program group. The default group name used will be PGUI. You may also elect to store the AC source control program icon in a different group.
You may also elect not to add a program icon and group for the AC source control software. In this case, you will have to start the program from the Windows command line or a shortcut for it in the Start menu later.



12. Once you click on OK, the install program will proceed to expand and copy all program and support files to the relevant directories. During this phase, a progress box will be displayed.



13. Upon completion of the installation process, a message appears instructing you to register your software with California Instruments. Since products are often shipped to a company address with no reference to the end-user, California Instruments may not have your exact address or email address. By registering both the AC source control software, you will be automatically notified of software upgrades.



14. You can now remove the PGUI installation disk.

In Windows 95®, the installation program will create a Start menu program group called PGUI and a program shortcut also called PGUI.

We recommend you keep the distribution disk in a safe place in case you ever need to re-install the AC source control software.

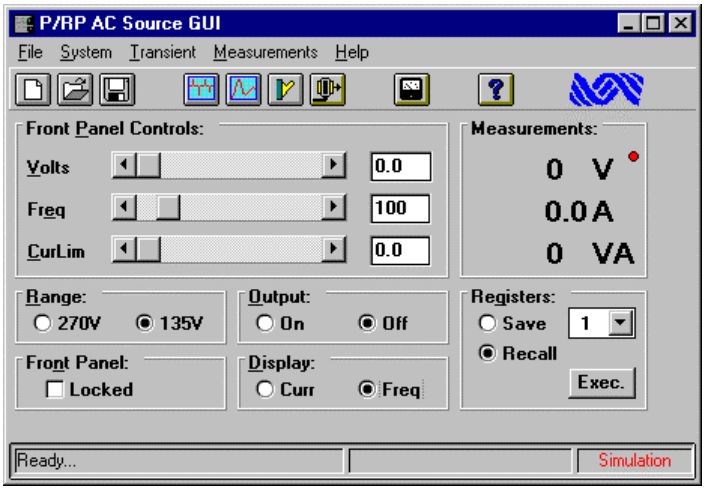
2.2 Windows 3.1® Installation procedure

The installation under Windows 3.1® or Windows for Workgroups 3.11® is very similar to the one for Windows 95®. Instead of using the Control Panel, use the Windows 3.1® File Manager to run the setup program located on the distribution disk. In Windows 3.1®, the installation program will create a windows group called PGUI in the Program manager.

See section 2.1 for further instructions.

3.
PGUI Main Window

The PGUI program is started by double clicking on the PGUI icon under Windows 3.1® or selecting the PGUI program from the Windows 95® Start Menu, Programs. Each time the program is started, it will try to connect to the AC Source if it was connected at the time the program was closed. If not or if the AC source cannot be found at the same IEEE address or serial port, the PGUI will launch in simulation mode.



This chapter will familiarize you with the information displayed on the Main program window. The main window is primarily used to control the steady state output of the AC Source. It also contains all the menus, the status bar and the toolbar.

3.1 Steady State Control

The main window provides a virtual front panel used to control the AC source from the PC. It has controls for all steady state parameters.

1. Use the Frequency slider to change the frequency between it lowest and highest value.

2. Position the cursor in the Frequency text box and enter a value that is greater than the maximum allowed frequency of 500 Hz, for example, type in 800 and press the Enter key. Notice that the value send to the AC Source is 500 Hz which is the upper Limit value. Using this direct data entry method is sometimes faster and more precise than using the slider control.

3. Notice the operation of the slider controls. There are three ways of operating them:

3.1. By dragging the slider handle. This sweeps the frequency up or down in increments that are a function of the speed at which you drag the slider handle.
3.2. By clicking on the arrows located at the left or right end of the control. This changes the frequency at 0.1 Hz increments.
3.3. By clicking between the slider handle and the left or right end of the control. This changes the frequency by 1 Hz at a time.

Note that the PGUI32 uses a different slider control. The operation of it however is very similar to the one described above.

Set the frequency back to 50.0 Hz.

4. Select the High voltage range. Notice the change in current limit. If this value was set to its maximum, it will be reduced by a factor of two.

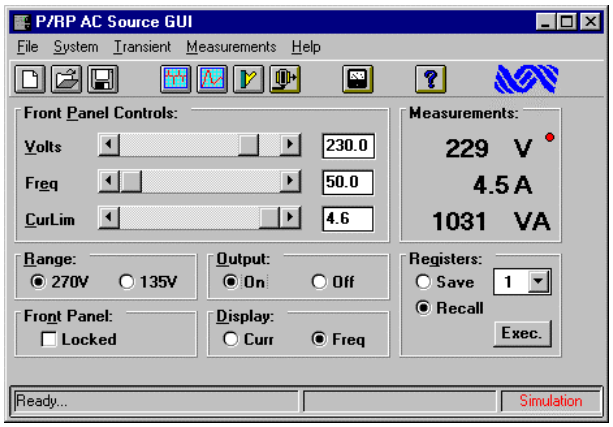
5. Set the voltage range back to Low range and notice that the current limit value does not change. The PGUI can only ensure you do not exceed hardware limits of the unit. It does not make a decision on changing user set values other than that.

6. Switch back to High voltage range and set the voltage to 230 Vrms.

7. Set the current limit to maximum.

8. Finally, close the output relay to apply power to the Unit Under Test.

9. The Steady State control panel should now look as shown below.



The Steady State control panel is always available and all other functions of the program can be accessed from its menu to tool bar.

3.2 Front Panel Lock

The front panel lock check box located in the lower left corner of the Main window is only useful when an AC source is connected to the PC. In this case, this check box allows you to toggle the unit between LOCAL and REMOTE modes. It is always recommend to put the AC source in REMOTE mode when using the PGUI program. This locks the front panel and prevents any one from interfering with the AC Source's operation.

The LOCAL mode can be used to release the unit for front panel access. There are situations in which it may be necessary to use the front panel.

3.3 Status Bar

PGUI status bar - Program and interface status

PGUI32 status bar - Program, error and interface status. Includes date and time readouts.

The status bar is always located at the bottom of the Main window and displays important information about the condition of the program and the AC source. It also contains a field that displays the connection method to the AC source as either IEEE-488, RS232C or Simulation. If you are in simulation mode, all functions of the selected AC source can be simulated.

NOTE: Make sure you are not in simulation mode when you have a unit connected as the program will appear to be working normally but in reality, you are in simulation mode. If you do not have a unit connected, you can only work in simulation mode.

3.4 Command Menu

The command menu contains all the menus available for the PGUI program. From these menu's, you can access all other screens in the PGUI. We will cover the individual menus and their purpose in the next chapter. For now, suffice it to say you will be using these menu's frequently.

3.5 Toolbar

A Toolbar is a set of iconized short cuts that allow you to access sub menu's with a single mouse click. As you get more familiar with operating the PGUI, you may rely on the Toolbar more and more as it gets you to the right screen faster. Each Toolbar button has a yellow tooltip that will popup when you leave the cursor on an icon for more than a second. This tooltip indicates the function of the Toolbar button your mouse is on.

3.6 Next

This concludes this brief tour of the Main window. Note that this window mainly serves to control the steady state output of the AC source. In the next chapter we will start exploring some of the available menus that access more advanced features of the AC source.

4.
System Menu

The System menu provides access to some key screens that allow you to configure the PGUI to work the way you want. This relates in particular to the interface settings when you have an AC source connected.

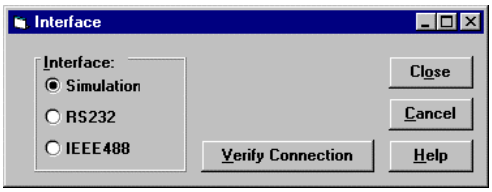
4.1 Interface

The Interface dialog is an important screen as it allows you to set the interface parameters to the AC Source. If these settings are incorrect, you will not be able to successfully use the PGUI program. The same screen also allows you to select the Simulation mode if you do not have an AC Source connected to the PC.

Finally, the Interface window also contains an interactive command line which allows you to send SCPI commands to the AC Source and read back responses to queries. This command line has a drop down list which contains commonly used SCPI commands so you do not have to memorize their syntax.

Exercise:

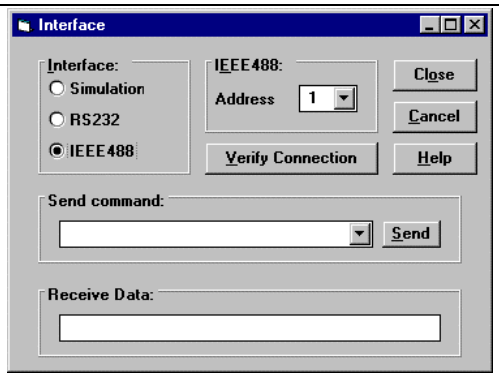
1. Pull down the System menu and select the Interface... sub menu or click on the IEEE connector symbol in the Toolbar. This will bring up the Interface window.



2. If you are operating in Simulation mode already, the interface window will be small and will only show alternative interface types such as IEEE-488 or RS232C. To display the full size Interface window, you have to select either IEEE-488 or RS232C.

3. Click on the RS232C option and observe the COM port and baud rate selections that appear. The bottom portion displays the command line. Note that no other COM parameters can be set. The serial format is fixed to 1 start bit, 8 data bits and one stop bit for all P and RP Series instruments.

4. Click on the IEEE-488 Bus option to select the IEEE interface. The Interface window will now allow you to select the Bus address for the AC Source. If you have a source connected on either interface, you can click on "Verify Connection" to establish the connection. This will report the model number and serial number of the unit found at the specified address or com port.



5. The PGUI32 will automatically scan all COM ports when RS232 is selected or all IEEE addresses when IEEE-488 is selected, looking for a supported AC source. If found, the com port number or IEEE-488 address will be set for the user. The 16 bit PGUI does not automatically scan all ports so the user will have to pre-select the correct port or IEEE-488 address. If the IEEE address or COM port settings are incorrect, you will not be able to communicate with the AC source and an error message will appear. Note that the P Series does not offer an IEEE-488 interface so you have to use RS232C. The RP Series offers both interfaces.

6. If you have a unit connected, use the Send Command pull down box to send commands to the AC Source and observe the response to any queries in the Receive box at the bottom.

7. Once you have established the connection or selected Simulation mode, click on Close to confirm your settings.

The remainder of this training manual will assume you are in simulation mode. You can continue to use the actual source connected through IEEE or RS232C if you wish. Most exercises will operate largely the same.

4.2 Configuration Settings

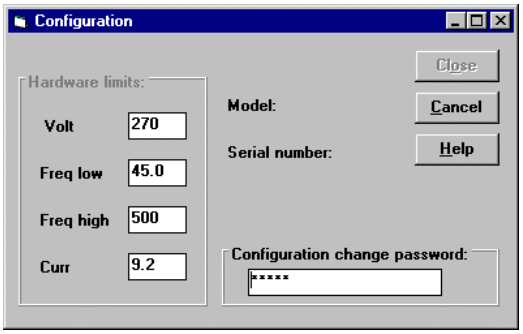
The Configuration sub-menu in the System menu brings up a dialog box that shows all the hardware limits and options for the connected AC source. These settings are determined by the AC Source configuration and cannot be changed by the user.

Exercise

1. Select the Configuration sub menu from the Source menu.

2. Verify that the limits and options match the configuration of your unit if you have a unit connected.

3. If you are in simulation mode, no model number or serial number will be visible.



4. Close or Cancel the window to proceed.

4.3 Power-On Settings

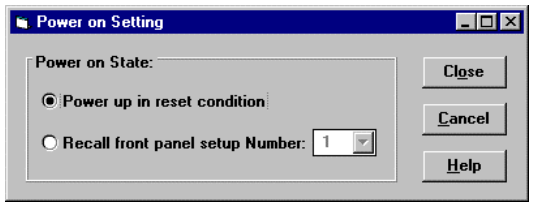
The AC Source initialization system allows you to specify the way the AC source is programmed at power up. Unlike regular test equipment, AC sources typically don't retain their last setting when a unit is turned off. This is done on purpose to prevent an accidental lethal high voltage output when a unit is turned on.

Instead, you can determine how the unit will power up regardless of the setting present when the unit was turned off. The Power-on Settings window located in the System menu can be used to select one of two power on options:

- Factory Default settings
- Setup Register 0 through 7

Exercise:

1. Pull down the System menu and select the Power-On Settings... sub menu. This will bring up the Power-On Settings window.



2. Select front panel setup register 2 as the power on default and click on Close to close the Power on Setting window.

3. Next we need to make sure the setup we want the unit to power up in is indeed stored in setup register 2. This is done from the Steady State Control panel.

4. At the right bottom of the main program window, you will notice the Save and Recall options. Select Save as we want to save the present front panel settings.

5. From the register drop down box, select register 2.

6. Click on the "Exec" button to Save the setup data to register 2.

7. If you have an actual P or RP Series connected, close the PGUI and turn off the AC Source. Wait a second or two and turn the power to the AC Source back on. Notice the unit powers up in the same setting as we just saved.

The Power-On settings window is not commonly used as it is rarely necessary to change the initialization values of the AC source.

Factory settings are as follows:

Voltage Range	Low
Voltage	0.0 V
Frequency	60 Hz
Output Relay	OFF

5. Measurements

Measurements can be used to obtain information on load conditions. The PGUI can obtain all available measurement from the AC Source. The AC Source measurements are shown on the right hand side of the main Steady State Control window.

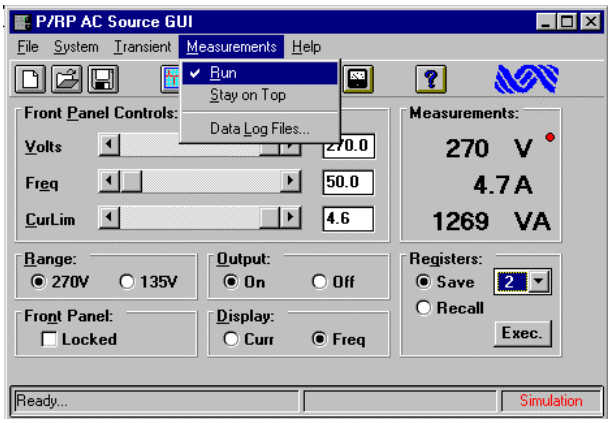
5.1 Enable and Disable Measurements

The P and RP Series provide feedback on output voltage and rms current. The PGUI calculates VA from these two parameters. VA = V * I. Do not confuse this readout with the true power in Watts. This information is not provided by the P/RP source measurement system.

The voltage readings received from the P or RP Series unit are averaged to improve the voltage measurement accuracy. Sudden changes in output voltage will not appear immediately due to this averaging technique.

The PGUI normally continuously polls the measurement data from the AC Source. You can stop this polling process by selecting the Measurement, Run sub menu. The PGUI32 will save the measurement state selected by the user (Run or not) and start up in the same mode.

Exercise: *1. Pull down the Measurements menu and notice the check mark in front of the run sub menu. This indicates measurements are enabled.*



2. Click on the Run entry to disable the measurements.

3. Notice how the moving red indicator disappears and the measurement data no longer updates.

4. To turn the measurements back on, repeat step 1 and 2.

5. Move the voltage and current limit sliders around and observe the impact this has on the measurements. Your settings and the Measurements should track.

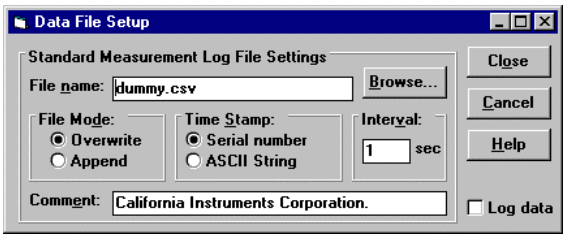
5.2 Recording Measurement Data to disk.

Measurements can also be logged to disk for use in other programs. The measurement data files are comma delimited (Comma Separated Value) so they can be imported in a spreadsheet immediately.

Before selecting data logging, you should set up the correct file mode and file name. This is done from the Data File Setup... window. We will set up a log file and record data for a period of time. Afterwards, we will use a spreadsheet program (if available on your PC) to analyze the data.

Exercise:

1. Pull down the Measurement menu and select the Data Log File... sub menu. This should bring up the Data File Setup window. The measurements can still be running in the background



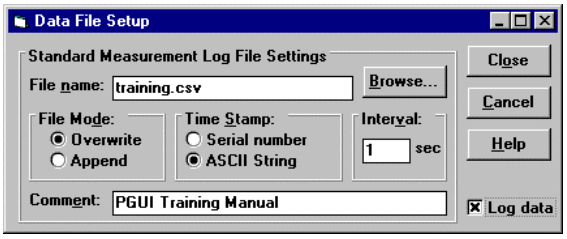
2. The default file name is "dummy.csv". If you want, you can enter a different file name or use the Browse button to select both a different directory and file name. You can also enter the new file name directly in the file name box. For this training exercise, we will use "training.csv".

3. Select the Overwrite mode if it is not already selected. This will cause a new file to be started each time you start a measurement cycle.

4. Select the ASCII string Time Stamp option. This will result in a readable time stamp for each measurement record. The Serial number format is specific to Microsoft Excel.

5. Add a comment in the comment line. This information will be added to the measurement data file and can be a useful reminder of the nature of the UUT from which this data was taken.

6. Finally, turn the Data Logging mode on by setting the check mark in the lower right corner of the Data File Setup window. The default logging interval is set to 1 second which is the minimum time between logging measurement cycles. The maximum time is limited to 3600 seconds or one hour between recordings.



7. Click on Close to confirm your selections and return to the Measurement window.

8. Use the Main control window to vary the voltage and or current limit so all readings will not be the same. Wait about 10 seconds to get at least 8 or 10 records and then click on the pull down the Measurement menu and click on Run to stop the measurement process.

9. Next we need to close the data file by turning off the data logging mode. Pull down the Measurement menu and select the Data Log File... sub menu. This should bring up the Data File Setup window. Turn off the check mark in the lower right corner to cancel the data logging mode.

10. Toggle to your Windows 95Ò Explorer or Windows 3.1Ò File Manager and locate the data file training.csv. If you used a different file, it should be under that name.

11. Open the file using Excel or Notepad if Excel is not available to you. The following table shows a fraction of the data file.

#1997-09-17 12:42:23#		PGUI Training Manual		
Date	Time	F	V	I
9/17/97	12:42:25	50	271	4.5
9/17/97	12:42:26	50	271	4.6
9/17/97	12:42:27	50	207	4.6
9/17/97	12:42:28	380.9	98	4.6
9/17/97	12:42:29	380.9	99	2.2
9/17/97	12:42:30	380.9	98	1
9/17/97	12:42:31	380.9	172	1
9/17/97	12:42:32	380.9	240	1

12. If you opened the file in Excel, you can use some of its graphing capabilities to display one or more parameters as a bar chart or line plot. Close the Excel or Notepad program when you are done with this.

This concludes the measurement chapter. Next we will turn our attention to the Transient generation system.

6.
Transient Programming

Transients are a powerful feature of California Instruments AC Sources. To get the most out of the AC Source and PGUI program, it helps to understand how the PGUI implements transient programming.

The California Instruments' P Series and RP Series do not have transient generation capabilities built into the AC Source controller. Instead, the PGUI is used to program the output of the AC Source under the control of a user specified transient list. The PGUI provides an easy data entry format for programming this transient list. Since transient execution is performed by the PC, the interface option (either IEEE-488 or RS232C) is required. This means that you cannot run transients from the front panel of the P or RP.

A transient list ends when you run out of steps (100 max.) or when the PGUI encounters an empty transient type.

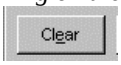
The following exercises will make the process of creating and running transients more clear.

6.1 Voltage Transients

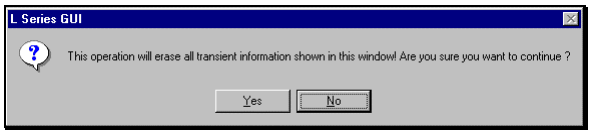
Voltage transients only affect the output voltage. Typical voltage transients are drops, steps, surges, sags and sweeps. Each transient step has a start and stop value for the voltage and a duration time. We will set up a few different voltage transients as an exercise:

Exercise:

1. Select the Transient menu which will bring up the Transient window.

2. Clear the present contents by clicking on the Clear All key located in the bottom right corner of the Window. 

You will be asked to confirm since this action wipes out the entire grid contents. Click on Yes to acknowledge the fact that you do indeed want to start from an empty grid. Note that the PGUI always recalls the last Transient setup present when the Close button was clicked. This always allows you to go back to your last transient program, even if you did not save it explicitly.



3. Go to the first row of the grid (step No 1). Transient programs always start execution from step No. 1.

4. Click on the drop down box and select the 'V Step' transient type.

5. Tab over to the 'Time (s)' field and enter 0.02. This corresponds to 20 millisecond which is the minimum time interval for most transient events except the Voltage Drop (10 ms) and the combined VF transients (40 ms).

6. Tab over to the right or click on the Voltage field. Notice that only those fields that have to be entered are white. All unused fields for the V Step function are grayed out. You can enter values in these fields but they will be ignored and any time you move to a new register, grayed out values will be erased.

7. Enter '120.0' for 120 Vrms. Note that if you are in the Low Voltage range, you should not enter values above the range limit of 270 Vrms. If you do, you

will get an error when you try to execute the transient list. The AC Source does not automatically switch range to accommodate a higher voltage as this would cause the output to be dropped temporarily.

8. Starting a transient program with a voltage step is good practice as it will ensure you start out at this specific voltage value, regardless of what the steady state value of the source is at the time the step is executed.

9. Move to step No 2 and select 'V Sweep' as the transient type. A sweep allows you to go from the present voltage value to a final voltage value in a specified period of time.

10. Tab over to the 'Time (s)' field and enter 5.0 for a 5 second sweep. Since we will sweep from 120 Vrms to 20 Vrms in 5.0 seconds, the Voltage slew rate will be (120-20)/5 = 20 V/s. There is no need to know this however as the PGUI will calculate this value for you and program the AC Source transient system accordingly.

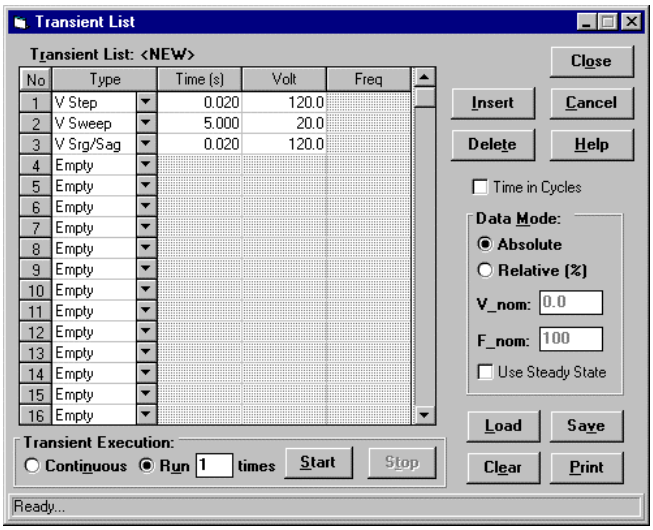
11. Enter 20.0 V for the Voltage value. This will cause the voltage to sweep down from the 120 V entered in step 1 to 20 volt.

12. Move to the next step (No 3) and select 'V Srg/Sag' as the transient type. A Surge/Sag allows you to go to the specified Voltage value for a period of time and then return to the previous voltage value.

14. Tab to the 'Time (s)' field and enter 20 ms. If our frequency is set to 50 Hz, this will cause the output to surge to 120 V for one full period of the AC output and then return back to 20 Vrms.

16. Enter 120.0 for the Voltage value.

17. This is the last event in our sequence so we leave the next step Empty.



18. Your Transient window should look like the window shown here at this time.

19. If you have unit connected, you can run the transient program by Clicking on the Start button at the bottom of the Transient Window. If you are in simulation mode, the program will appear to run the transient and stop after the 5.04 second duration expires. The Start button is disabled while a transient program is running.

Next we will perform a similar exercise but this time for the frequency.

6.2 Frequency Transients

Frequency transients only affect the output frequency.

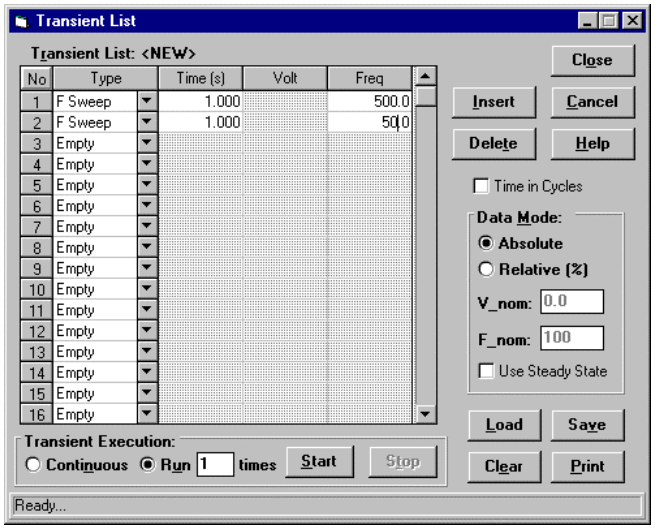
Exercise:

1. Clear the existing transient program by clicking on the Clear button located in the lower right corner of the Transient screen. When asked, confirm the clear operation.

2. Move to step 1. and select 'F Sweep' as the Transient Type. Tab to the 'Time (s)' field and set the time to 1.000 seconds.

3. Set Frequency field to 500.00 Hz. This will cause the frequency to sweep up from its present steady state value to 500 Hz..

4. Move to the next step and select 'F Sweep' again as the Transient Type. Tab to the 'Time (s)' field and set the time to 1.000 seconds. Set the Frequency value to 50.00 Hz. This will cause the frequency to sweep down to 50 Hz.



5. Your Transient window should look like the window shown here at this time.

6. If you have a unit connected, you can run the transient program by clicking on the Start button. You can select the Continuous mode if you want the program to run in an endless loop.

6.3 Voltage and Frequency Transient

The Voltage and Frequency transient is convenient if you want to change both parameters at the same time.

Exercise:

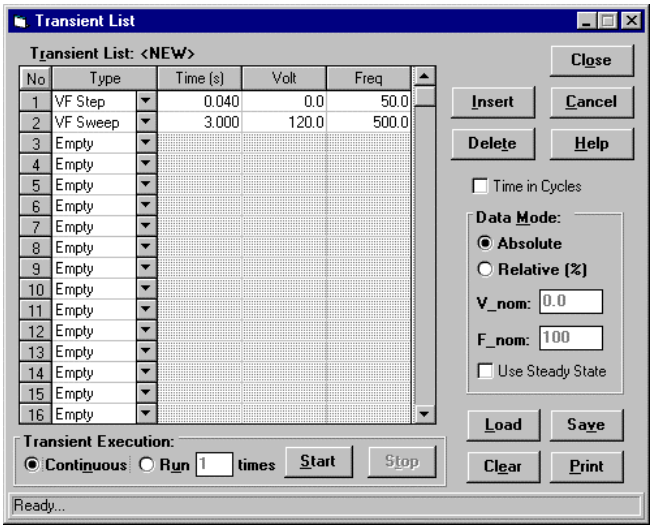
1. Clear the transient list using the Clear button. Confirm this operation when prompted.

2. Move to the first row (No 1) and select the 'VF Step' transient type.

3. Set the Time (s) field to 0.04 for a 40 msec time. Set the Voltage field to 0.0 V. Set the Frequency field to 50.00.

4. Move to the second row (No 2) and select the 'VF Sweep' transient type.

5. Set the Time (s) field to 3.000 for a 3 second sweep time. Set the Voltage field to 120.0 V.. Set the Frequency field to 500.00.



6. Your Transient window should look like the window shown here at this time.

7. If you have a unit connected, you can run the transient program by clicking on the Start button. If you are in simulation mode, the PGUI will wait for the duration of the transient program (3.04 sec in this case) and stop.

6.4 Data Entry Mode Options

The PGUI supports several data entry modes to facilitate transient program development. Specifically, the following modes are available:

- Absolute data entry mode (default mode). Data entered in the data entry grid represents actual voltage and frequency values.
- Relative data entry mode. When selected, values entered are interpreted as a percentage of a nominal Voltage and nominal frequency. The nominal values can be entered in separate data entry boxes or the steady state values can be used.

Relative data entry mode is useful if the same transient program must be executed on a UUT that can operate from different nominal line voltages. Instead of developing separate transient programs for each line voltage, a single relative program can be setup and run with different nominal values. This means the values are entered in a percentage of nominal instead of absolute.

When using the relative data entry mode, the PGUI program cannot determine if the values you enter exceed the AC Source limits. Normally, the PGUI watches what you enter and corrects you if you make a mistake. For example, if you enter 160 V while in the low voltage range, you will get an error message and the voltage value will be set to the maximum voltage for the range you are in. In the relative data entry mode, the PGUI does not know what the nominal value will be when you execute the transient program and thus cannot check. Instead, you will get a run-time error when you execute the transient list.

Time delays can be entered in one of two ways.

- Time in Seconds (default mode). Time is entered in actual seconds.
- Time in Cycles. Time is entered in cycles. The length of each cycle is a function of the programmed frequency.

Note that when using the Time in Cycles data entry mode, time periods are calculated from the user entered cycle information using the Frequency present at the beginning of each transient list step. If the transient step affects the frequency (e.g. F Step of F Sweep), the calculated time period is based on the frequency value at the beginning of the step. To avoid confusion, it is recommended to use cycle entry mode only when performing primarily voltage transients.

Exercise:	*1. Use the Clear button to clear the transient grid and confirm this operation when prompted. This should start you out with an empty grid.*
	2. On the right hand side of the Transient window are the data entry mode options. Enable the "Time in Cycles" check box and select the Relative (%) mode of data entry. Make sure the "Use Steady State" check box is off. This means all data you enter will be in percentage of the Nominal values shown in the V_nom and F_nom data entry boxes.
	3. Enter a voltage transient program similar to that in exercise 6.1 on page 27. You can use the same values for voltage but keep in mind that 120 now refers to 120 % of V_nom. If V_nom is set to 120 V, you are effectively changing the voltage to 144 Vrms. Make sure you are in the 270 V range or you will get a run time error !!
	4. Try to enter a voltage value over 200. You will not be able to as in this mode, all data values are limited to 200 %.
	5. If you have unit connected, you can run the transient program by clicking on the Start button.

6.5 Saving Transient programs

Transient programs can be saved to disk for later recall. This allows you to create a library of commonly used test programs. The transient program information is stored in ASCII text files with a TLS extension. It is recommended that you do not edit these files directly using a text editor but rather use the PGUI program to edit existing TLS files. You can load any file using the 'Load' button. It is also possible to print any loaded transient program using the Print button.

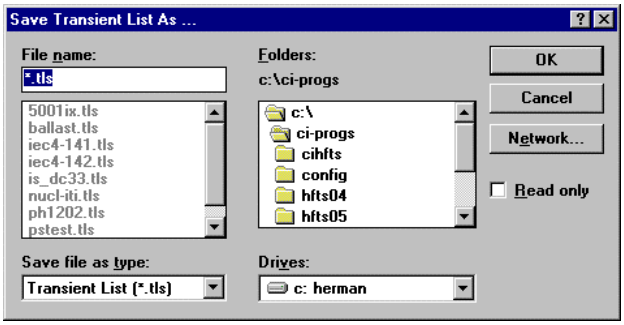
The following exercise will show you how to save a transient program, clear the contents of the Transient window and then reload the program we just saved.

Exercise:

1. Using the last transient program we have created, click on the 'Save' button.

2. This brings up the File Save dialog box shown here.

3. The default directory is the PGUI program directory. You can change to any directory and or drive you like.

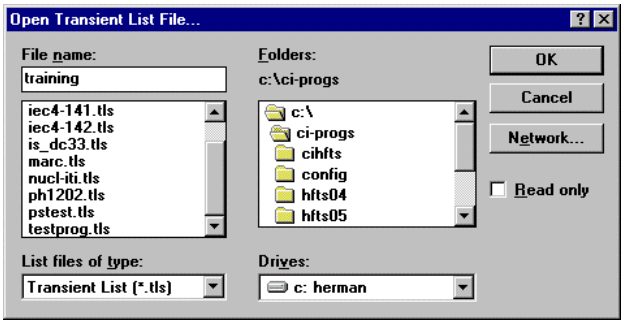


4. Enter a descriptive file name. A TLS extension will be added automatically. E.g. use TRAINING

5. Click on OK to save the transient program under this name.

6. Clear the present contents by clicking on the Clear key located in the bottom right corner of the Window.
You will be asked to confirm since this action wipes all the entire grid contents. Click on Yes to acknowledge the fact that you do indeed want to start from an empty grid.

7. Now that all your transient information is gone, click on the 'Load' button and select the TLS file you saved earlier.



8. This restores the transient program you saved earlier.

9. Close the Transient program and return to the Main program Window.

7. AC Source Setup Files

Setup files are used to store AC Source Front panel settings. Only steady state information is contained in these files. All other information is retained in the non-volatile memory of the AC Source controller. Setup files always have a STP extension and are saved in an ASCII format. We do not recommend you edit these files however other than through the PGUI itself. Editing a setup file may corrupt it to the point where it can no longer be recalled.

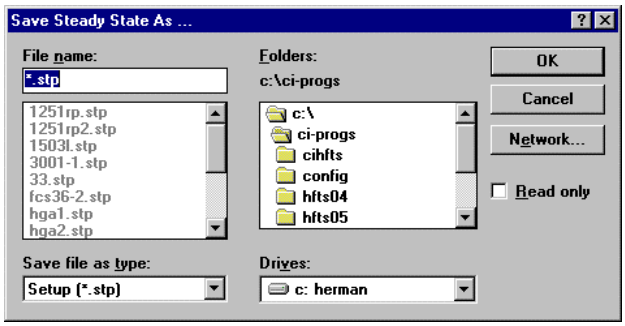
7.1 Saving front panel setups

Setup files are saved through the File menu or from the Toolbar. When you save a setup for the first time, you will always be prompted for a file name. If you saved the setup before or you recalled a setup from disk, the same setup filename will be used for any subsequent save operations unless you use the 'Save As...' sub menu option.

Exercise:

1. Use the Steady State controls to program the steady state parameters to a specific setting. For example, set the frequency to 100 Hz, voltage to 100 Hz and current limit to 2 Arms.

2. Next, pull down the File menu and select the 'Save' sub menu. This will bring up the Save As... dialog box since this is the first time since starting the PGUI that you saved a setup file. As such, you need to supply a file name.



3. Enter a descriptive file of no more than eight characters. The STP file extension will automatically be added. For example, enter TRAINING as the setup file name.

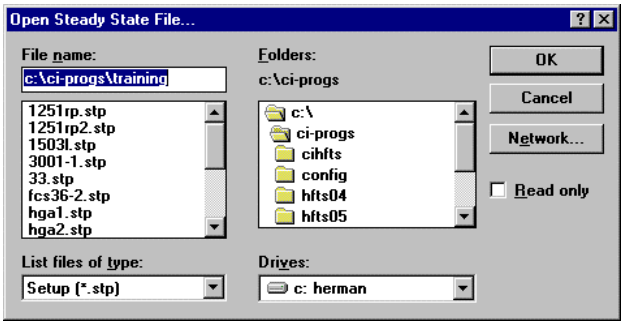
5. Click on OK to confirm your file name assignment. The setup information is now saved to disk.

7.2 Recalling front panel setups

Next we need to clear the present Steady State settings to make sure the setup file can be used to restore them.

1. Change the voltage, frequency and voltage range to make sure you're steady state settings are different from the one you just saved.

2. Pull down the File menu and select the Open sub menu. This will show you a list of all setup files in the working directory.



3. Select the training.stp file and click on Open. This will cause the Steady State settings to be recalled from disk. If you have an AC Source connected, it will be programmed with the settings from the setup file.

4. Check the main window and confirm that all settings have been restored.

8. Conclusion

This concludes this PGUI / PGUI32 training manual. If you worked your way through all the exercises in this manual, you have seen a good subset of the program's capabilities. If you want to know more, use the on line help supplied with the program. All windows have a Help button which gets you directly to the relevant help topic. You can also use the Help menu to see the help table of contents or do a search on a specific topic.

If you have any comments about this training manual or the PGUI / PGUI32 , please let us know. We constantly strive to improve our products and meet our customer's needs. You can email your comments to:

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