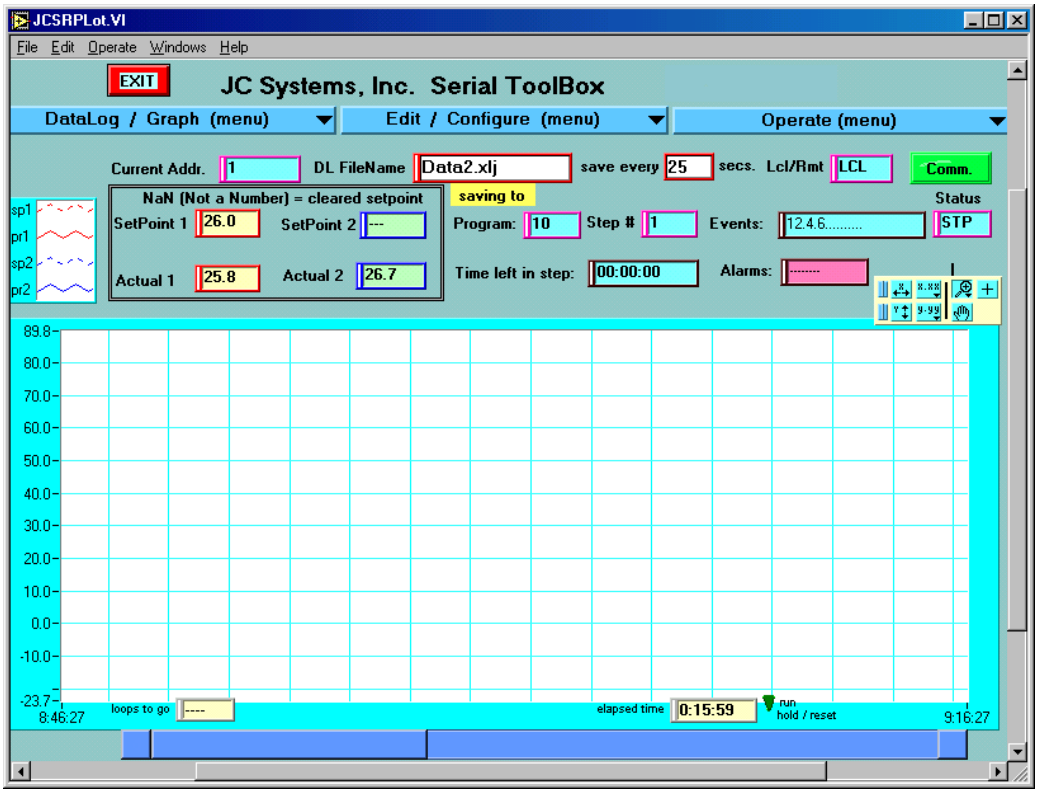
OPERATING INSTRUCTIONS

JC SYSTEMS TOOLBOX (SERIAL AND GPIB)

Please Note: The LabView Runtime Engine must be installed on the computer for the ToolBox Programs to operate. The National Instruments Runtime Engine can be installed from the JCS CD by clicking on "Setup.exe" in the Runtime Folder under the National Instruments Run-Time Engine 6.1 Folder.

Install either the Serial ToolBox or GPIB version (or both) by clicking on the appropriate Setup File. (Must be a National Instruments GPIB card for the GPIB program to work).



This is the Main Display Screen for the ToolBox programs. It has a real time graph of the setpoints and actual values for both channel 1 and channel 2. The time span (x axis) can be changed up to a maximum of 24 hours via the Datalog /Graph pull down menu. The chart "y" axis values can be changed on the fly by clicking on them and when highlighted, entering desired values. The program includes a data log capability and saves real time program information into a "tab delimited" file suitable for use with spreadsheet programs such as Excel. The frequency of data recording can be adjusted by means of the DataLog / Graph Pull Down menu. The data log action is started and stopped from the DataLog / Graph Pull Down menu.

Note: Right click on any of the buttons or displays and select "Description" for help about that item.

The screen is updated every 5 seconds to insure a current display of information.
Setpoints, Actual Temperature (humidity or altitude), and all important information are displayed numerically on the screen in addition to being displayed graphically.

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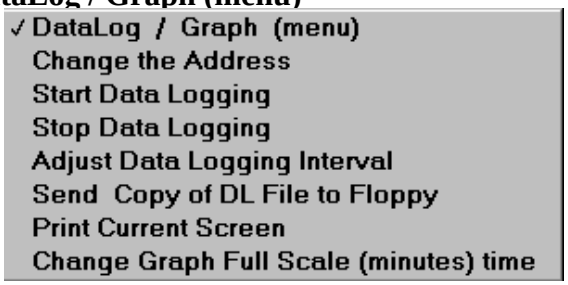
Access to the various features and choices are by means of three pull down menus (located across the top of the Main Screen.). Note that each screen allows you to change the address of the unit. If you are data logging, the unit being data logged follows the address.

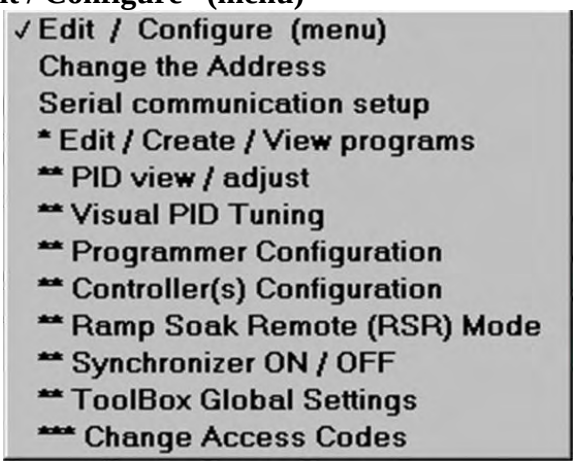
The "DataLog / Graph (menu)



This is the Menu you use to deal with the data logging and Main Screen display.

The choices are readily available.

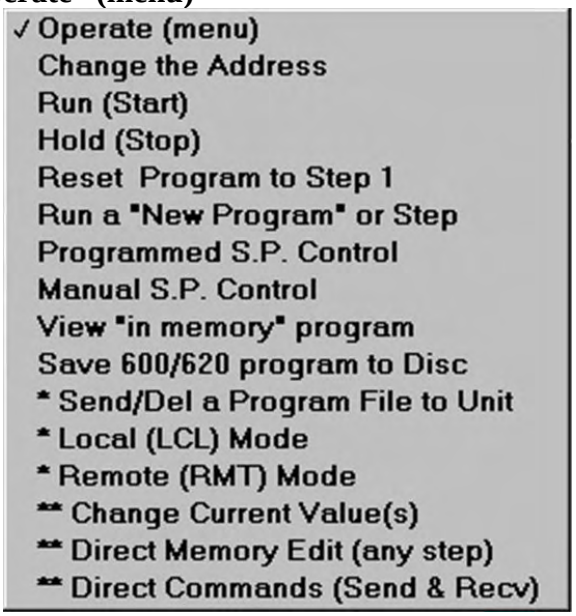
The "Edit / Configure" (menu)



Utilize this menu to change configurations or edit programs. The Configuration choices are protected by an access code.

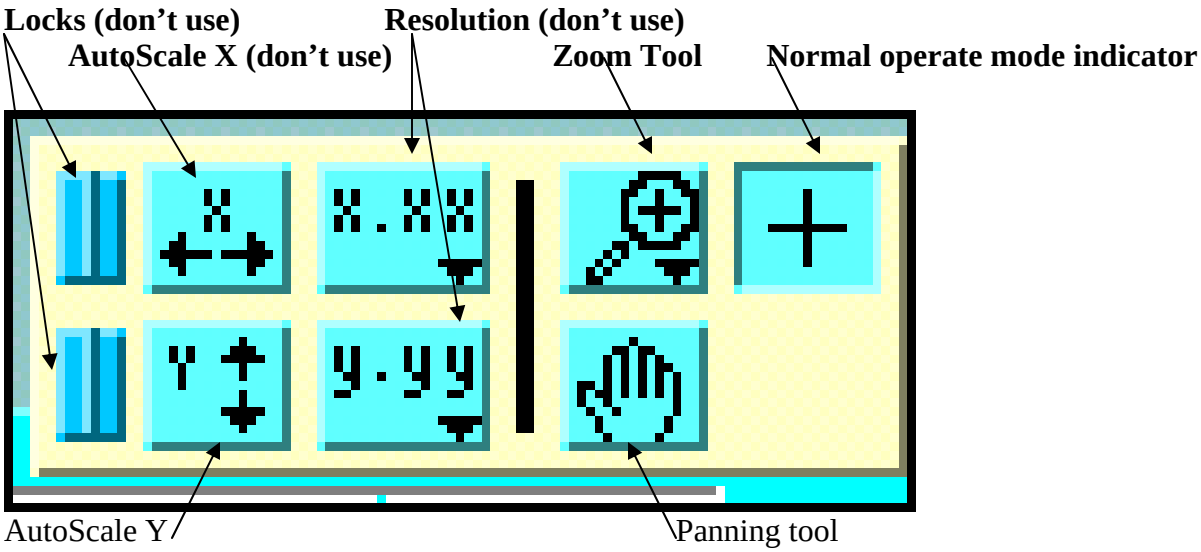
There are three levels of access codes available in this program. Normal usage items (with access codes are shown with one (1) asterisk. Configuration changes are protected with a 2nd level access shown with two (2) asterisks. The 3rd level access code is used to protect the assignment of the two lower access codes. Each higher level of access code will allow access to lower level access items.

The "Operate" (menu)



The "Operate" menu is utilized for the normal operation of the chamber. An operator can easily load programs, run them and do manual setpoint control. Programs are loaded and saved from this menu. Provisions are provide to actually examine the stored programs in the memory of the 600A and 620A Programmer/Controllers.

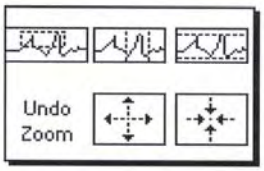
CHART TOOLS PALETTE (upper right corner of chart)



Normally, you are in standard operate mode, indicated by the plus or crosshatch. In operate mode, you can click in the graph to move cursors around.

If you press the Panning tool, shown to the left, you switch to a mode in which you can scroll the visible data by clicking and dragging the plot area of the graph.

If you press the Zoom tool, shown at the left, you can zoom in or out on the graph. If you click the Zoom tool, you see a pop-up menu to choose methods of zooming. This menu is shown in the following illustration.



A description of each of these items follows.

Zoom by rectangle.

Zoom by rectangle, with zooming restricted to *x* data (the *y* scale remains unchanged).

Zoom by rectangle, with zooming restricted to *y* data (the *x* scale remains unchanged).

Undo last zoom. Resets the graph to its previous setting.

Zoom in about a point. If you hold down the mouse on a specific point, the graph continuously zooms in until you release the mouse button.

Zoom out about a point. If you hold down the mouse on a specific point, the graph continuously zooms out until you release the mouse button.

Note *For the last two modes, zoom in and zoom out about a point,* `<Shift>` *-clicking zooms in the other direction.*

Click on the Reinit. Y button to restore the Max – Min Y values after AutoScale Y is used.

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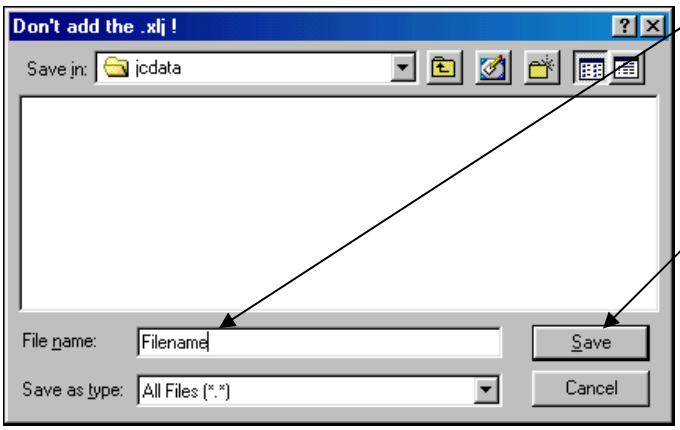
Detailed information: When you start the Data Log

This Pop UP menu shows up.

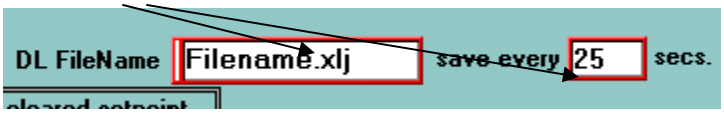


Type your filename here

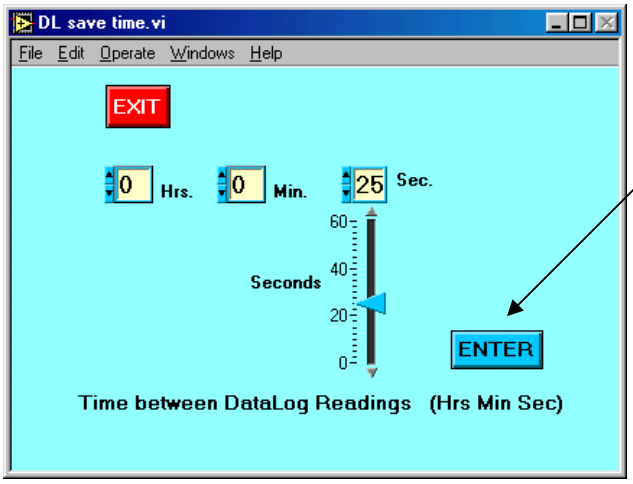
Don't add the ".xlj" as it is added to your filename automatically

Push to accept your selection

The fact that you are logging data is shown by the FileName and data log interval on the main screen



You can change the data log interval by selecting "Adjust Data Logging Interval" on the Pull Down Menu.

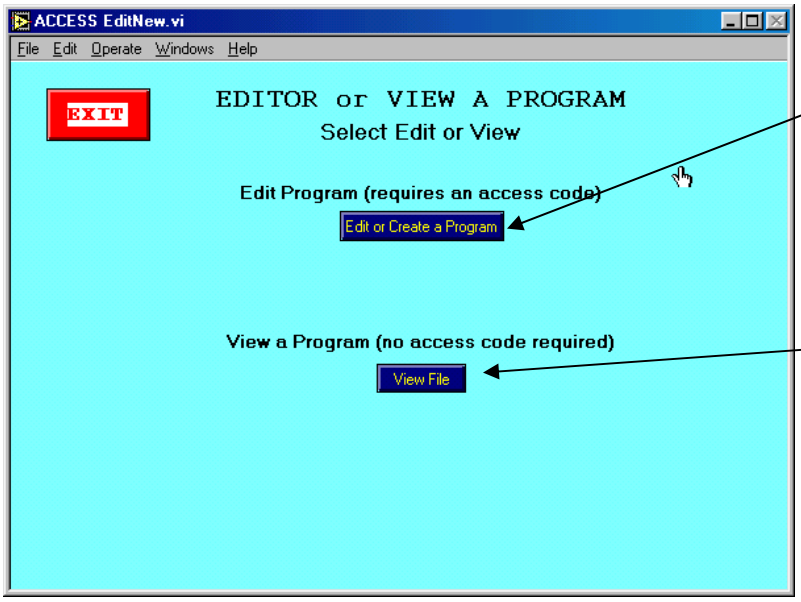


Set your desired time between readings then click the ENTER Button

The "full screen" (x axis) on the graphical display is selected by choosing Change Graph Full Scale (minutes) time on the DataLog / Graph menu.

The Edit / Configure" menu allows access to a number of important capabilities.

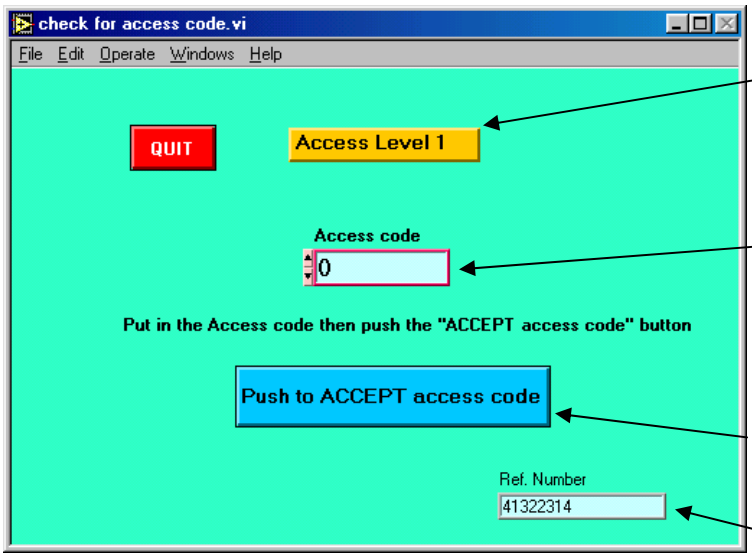
Edit / Create /View programs screen



Click here to edit or create a program (requires Level 1 access code)

Click here to only view a program (cannot edit from this selection)

Access Control Screen:



Shows the level of access code required (1, 2 or 3)

Enter your access code number here (default is "0"). Change the access codes for the various levels by selecting "Change Access Codes" on Edit / Configure Pull Down menu.

Click here to accept the code entered

Call JC Systems with this number if you forget you access code.

The level 3 access code number allows entry to functions protected by Level 1, Level 2, or Level 3 access.

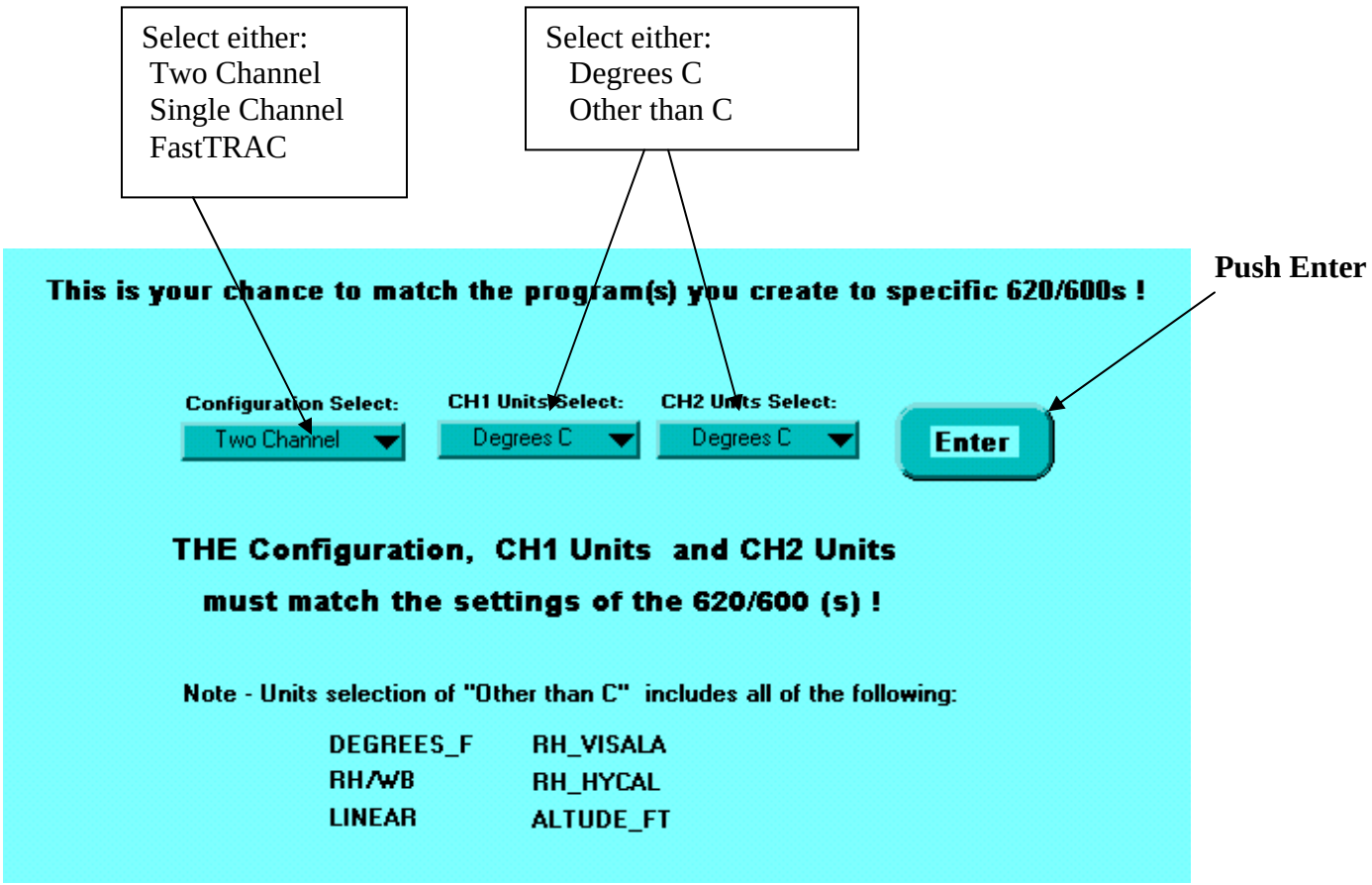
The level 2 access code number allows entry to functions protected by Level 1 or Level 2 access.

The Level 1 access code number only allows entry to Level 1 access functions.

Program Editing:

When you create a new program you must specify the Programmer configuration and channel configurations.

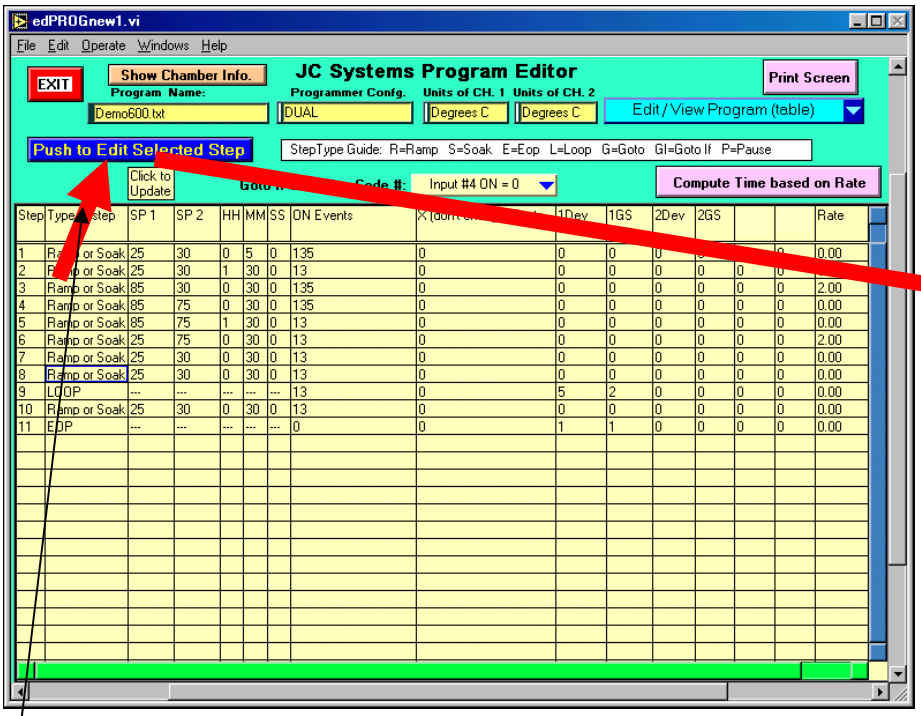
This is a safety check when loading a program to a 600A or 620A, the configuration of the unit is compared to the configuration of the program and the ToolBox program will not allow the loading of a mismatched program to the unit. Loading a program written for a degree F unit into a degree C unit would result is over temperature conditions to the devices under test and the chamber itself.



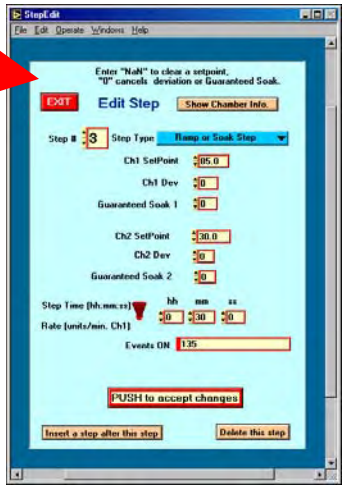
This information becomes part of your program.

Edit program continued on next page-

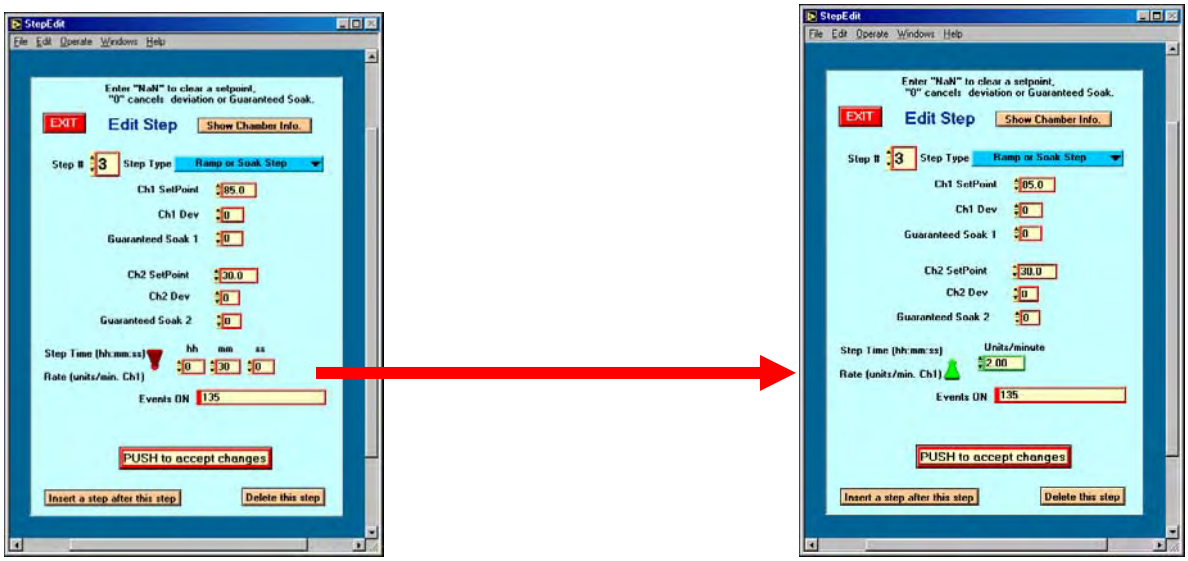
ToolBox Program Editor



First PopUp EDIT Screen



First, select step number to edit then click on “Push to Edit Selected Step” Button to access Pop Up Edit Step Screen.



Clicking on the Red Toggle switch changes the popup from TIME ENTRY to RATE ENTRY

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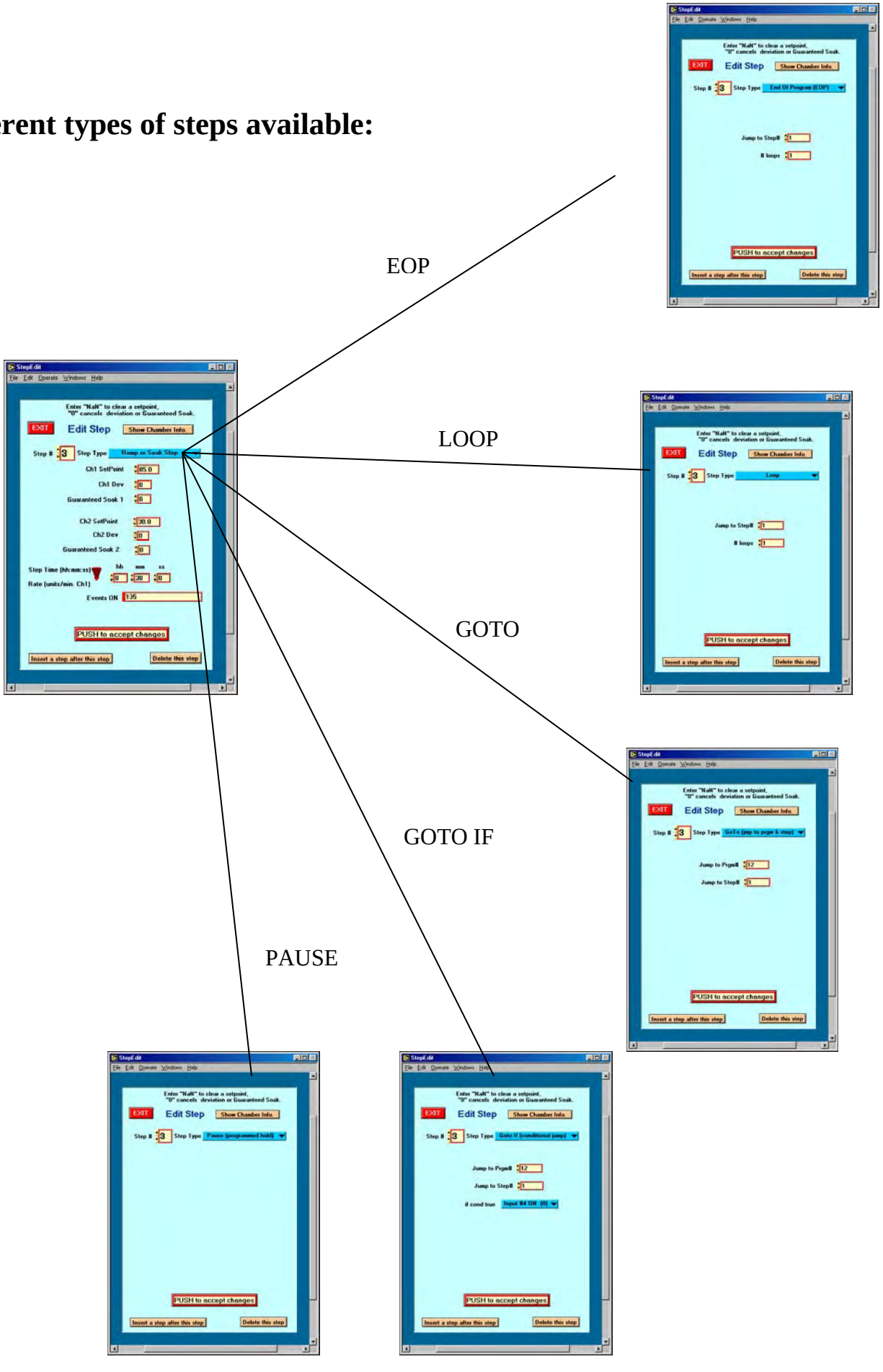
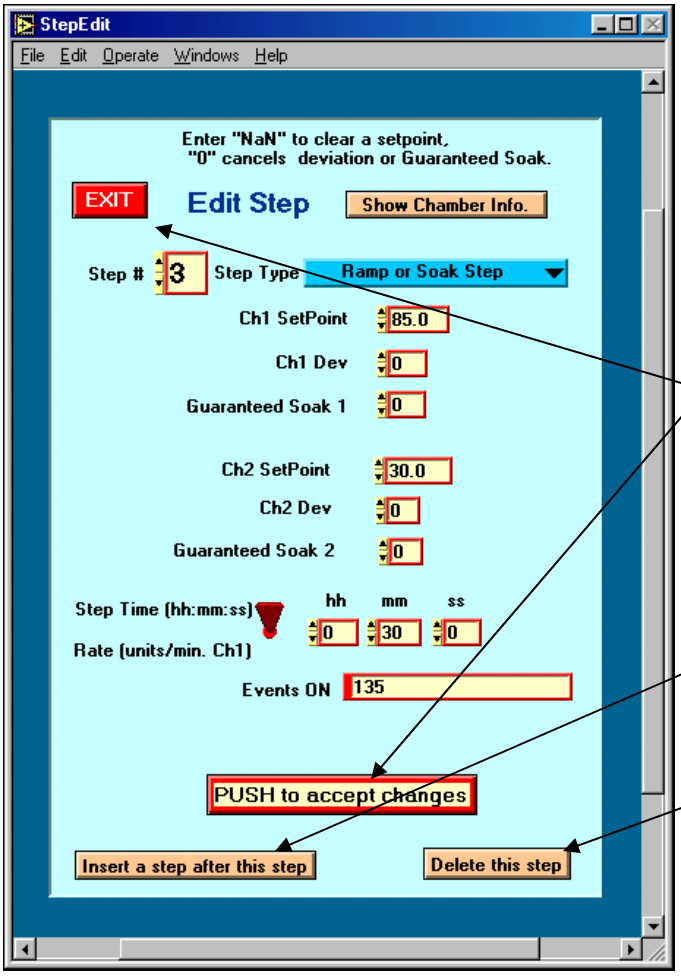
Different types of steps available:



PopUp screen edit screen details:



After you enter the values for this step:

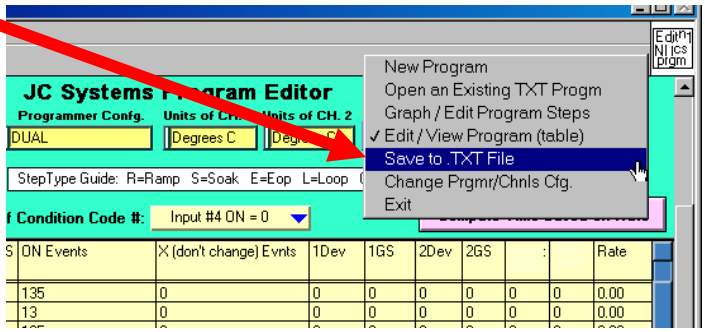
Click on the "PUSH to accept changes" button, which advances you to the next step.

If you have completed all of your entries, click on the "EXIT" button to return to the table display.

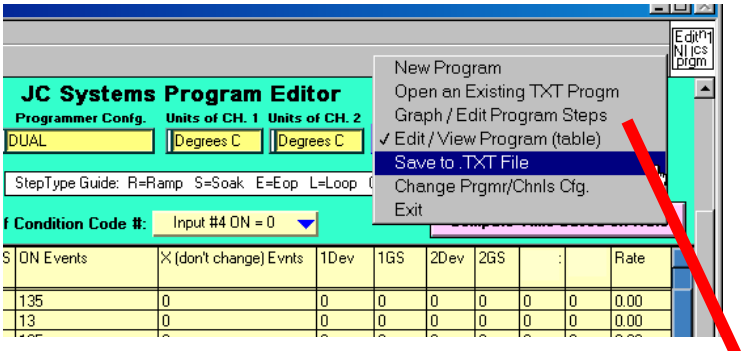
Note: You can insert a step after this step by clicking on the "Insert a step" button.

You can delete the current step by clicking on the "Delete this step" button.

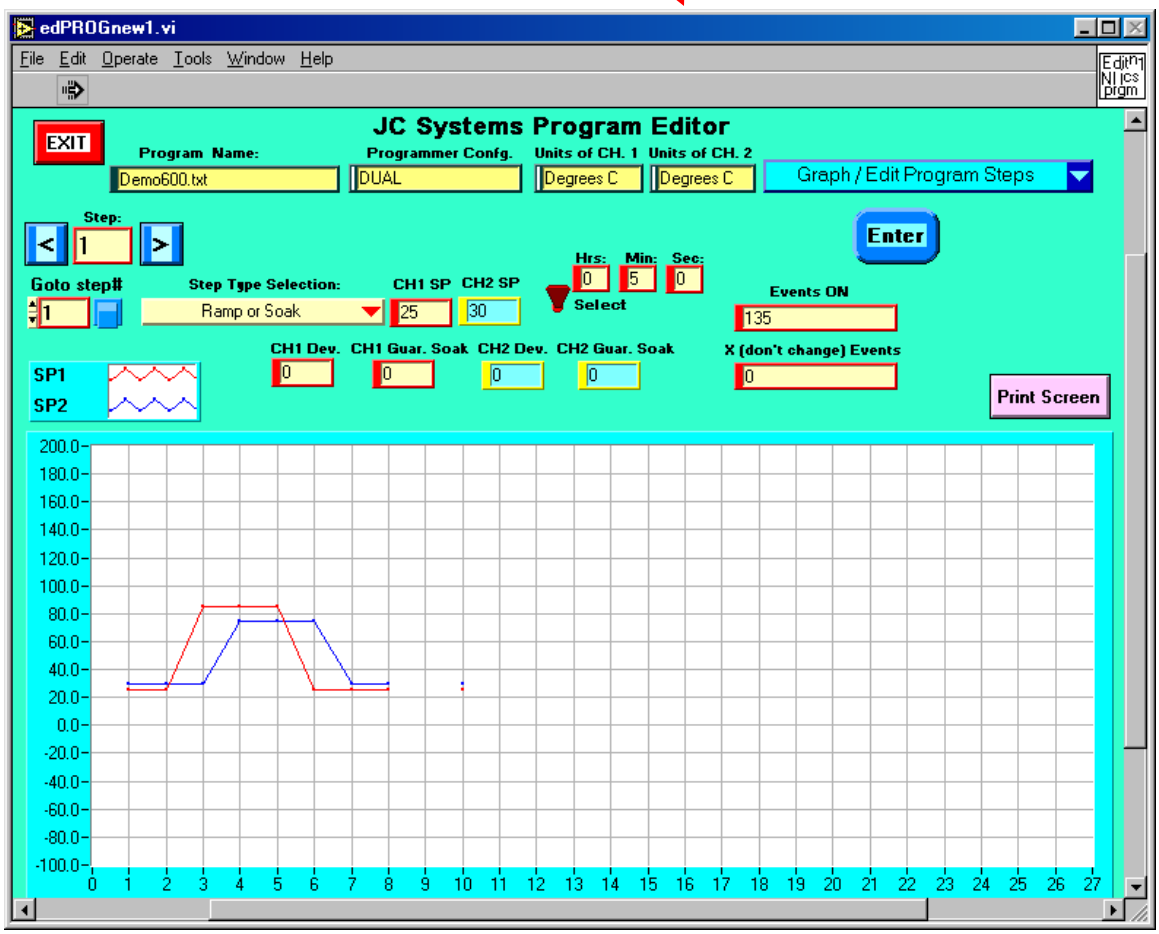
When the editing is done, save your program by clicking on "Save Program to a File" on the table pull-down menu.



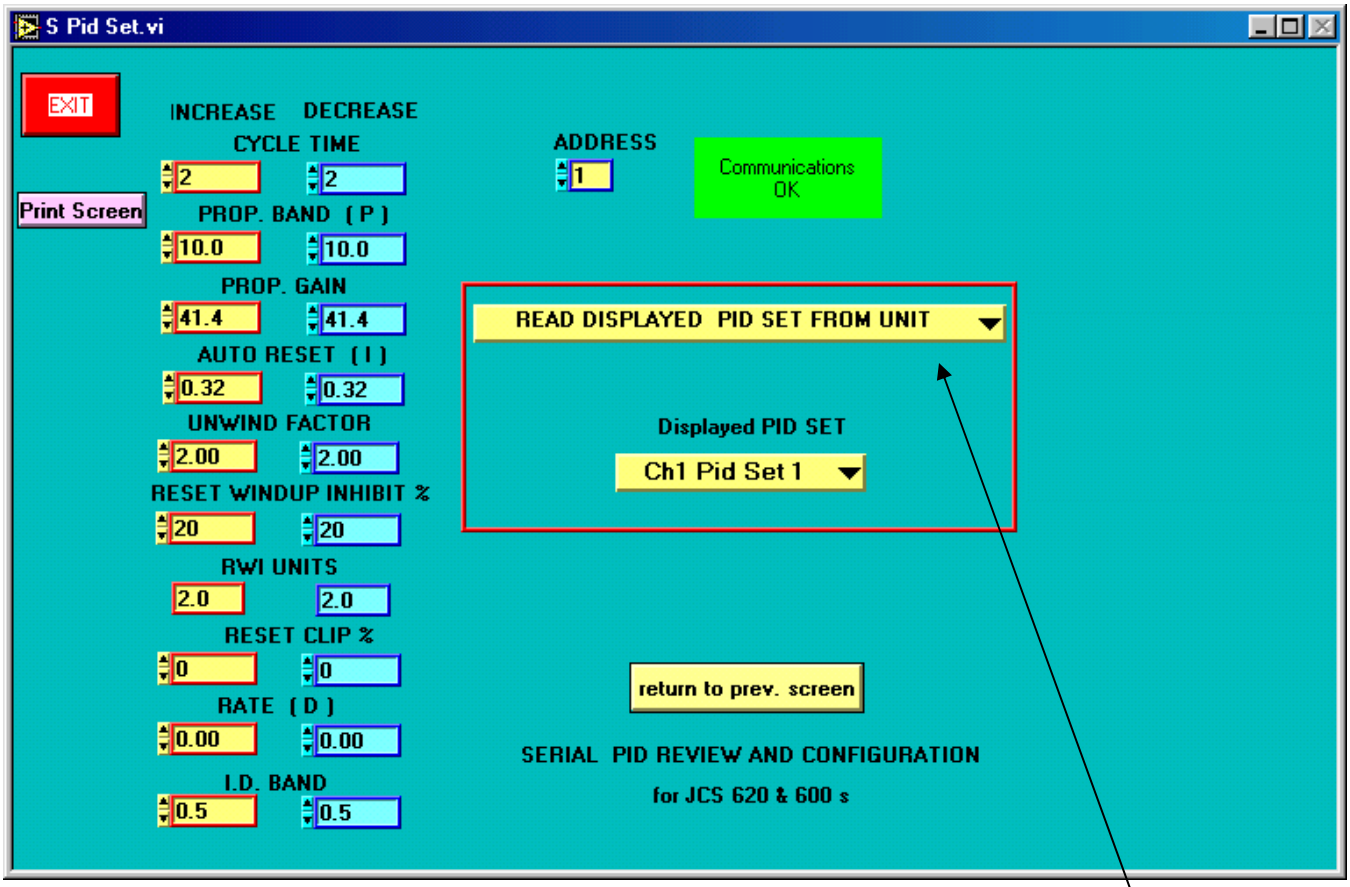
Viewing program as a graph:



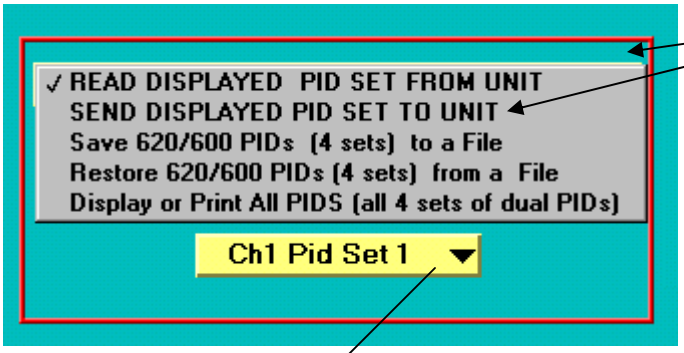
View the program as a graph by clicking on "Graph/Edit Program (table)



PID view / adjust:

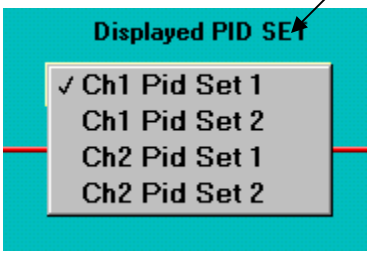


You can make changes directly then Send them to the unit by this pull down menu



Click here to send the changed PID values to the unit.

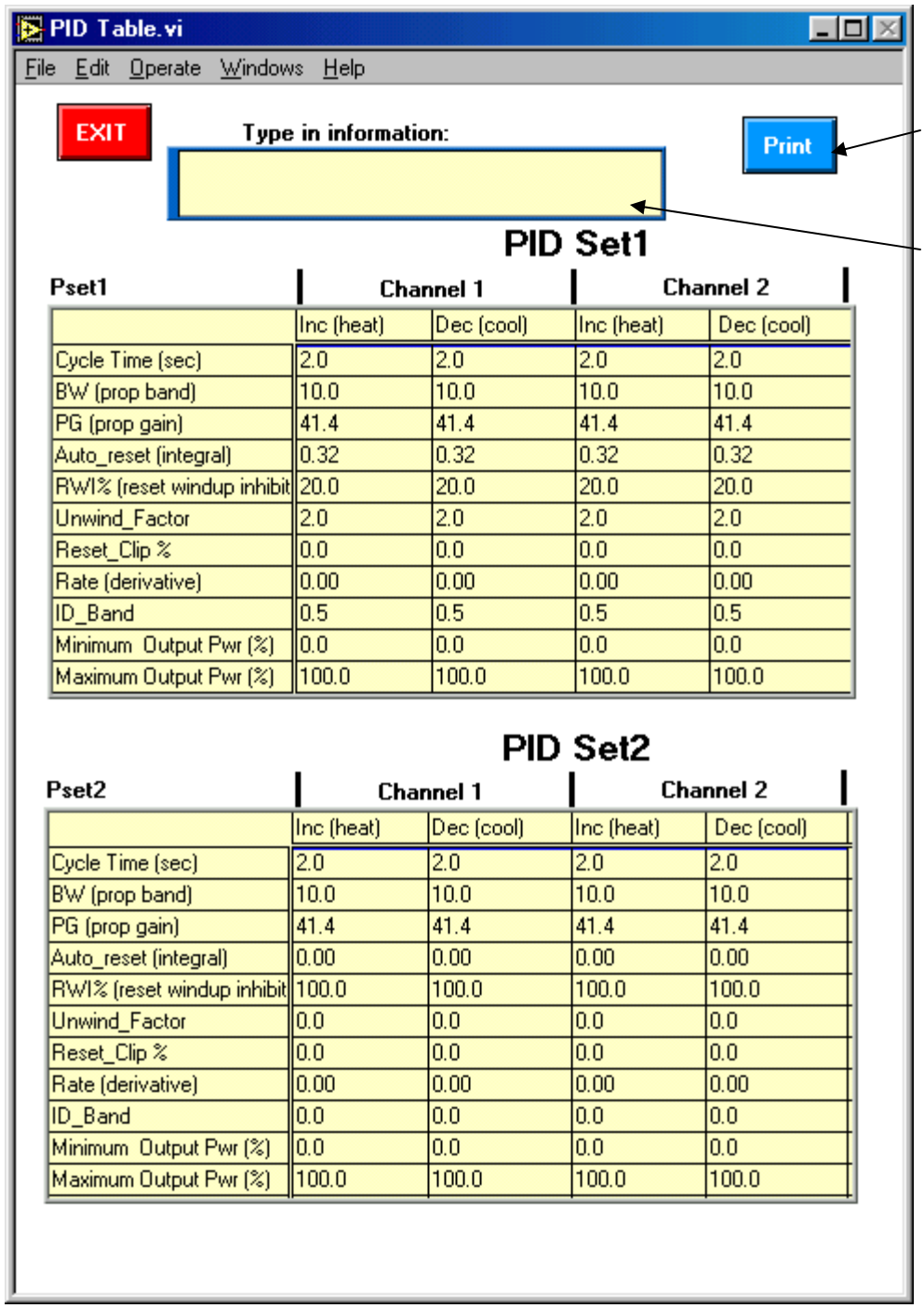
Use this pull down menu to Save to file, Restore from a file, or to Display or print all 4 sets of dual PIDs



Use this pull down menu to select which PID set is to be displayed.

This is the display for all 4 sets of dual PIDs from the selection of

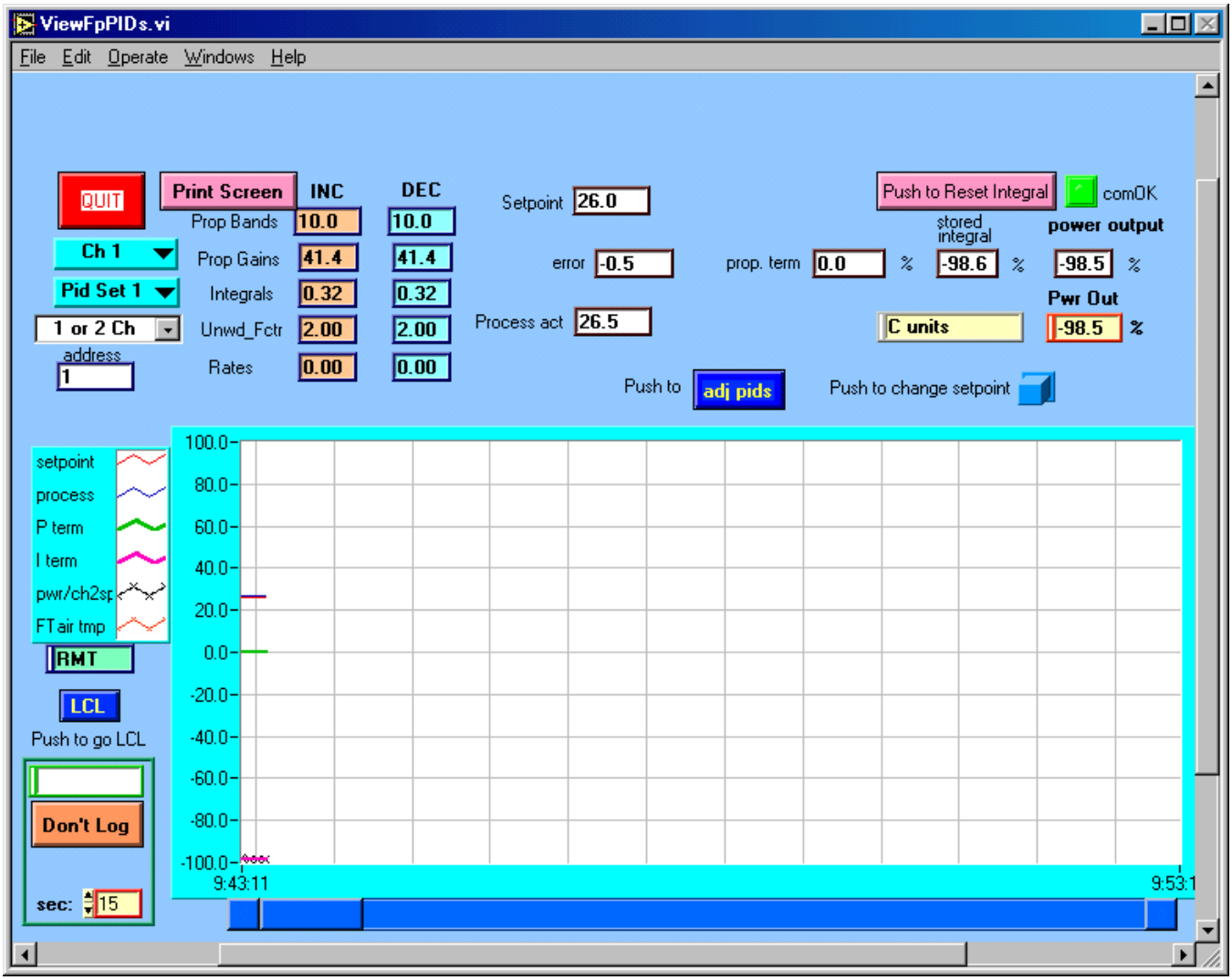
Display or Print All PIDS (all 4 sets of dual PIDs)



If you have a printer connected to the computer, click here to have a hard copy.

Type in any information you would like to have included in the print out such as the chamber number etc.

Visual PID Tuning:



This screen allows visual access to the Proportional action, Integral action, Power output % while showing the effects of each of the above on the Process vs. the Setpoint. It speeds up dramatically the tuning of the controller. A data log capability is provided to allow records of chamber performance and controller internal actions in real time.

The normal sequence of setting up a controller is to first set the Integral action to 0 and adjust the proportional band so that there is no power oscillation (indicating stability in the chamber system). Add small amounts of Rate (typically between 0.1 and 0.4) for chamber systems that have a large amount of lag between control action applied and the resulting change in air temperature. (0.4 is a very large amount of Rate Action). Fast response chamber should have 0 rate for increase and decrease PIDs.

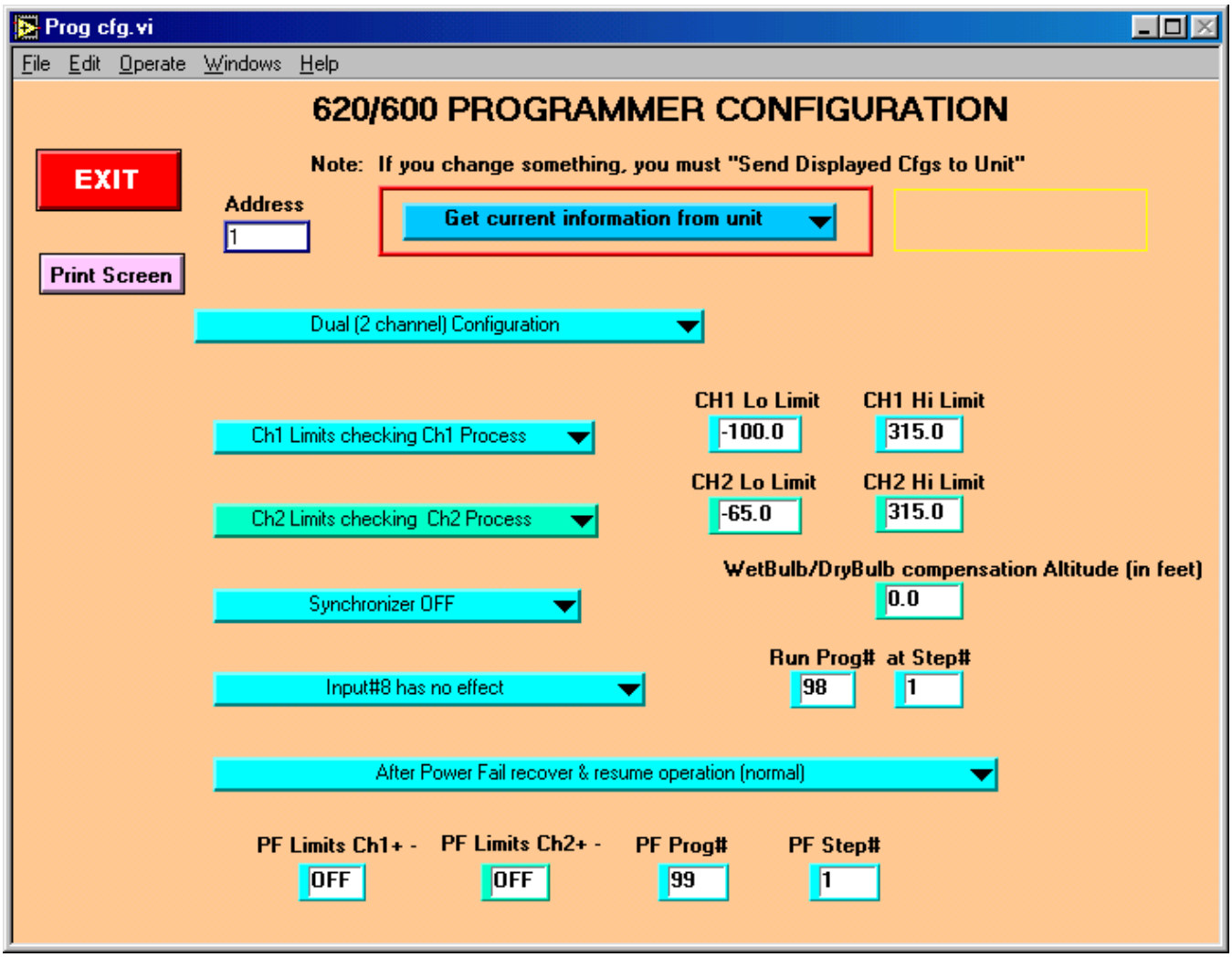
After you have determined the proportional band for stable operation of the chamber at HI, LOW and close to ambient temperatures, add integral (Automatic Reset) to correct for the droop between setpoint and process temperature. Be sure that you do not utilize too much Reset Action so as to cause a periodic variation in the power term as shown on the graph and digital display.

After you are satisfied with the chamber performance, save the PID Settings to file and the Configuration for the programmer and controllers to file.

If someone accidentally damages the controller, a different unit can be substituted and the Configurations downloaded from file followed by the PIDs.

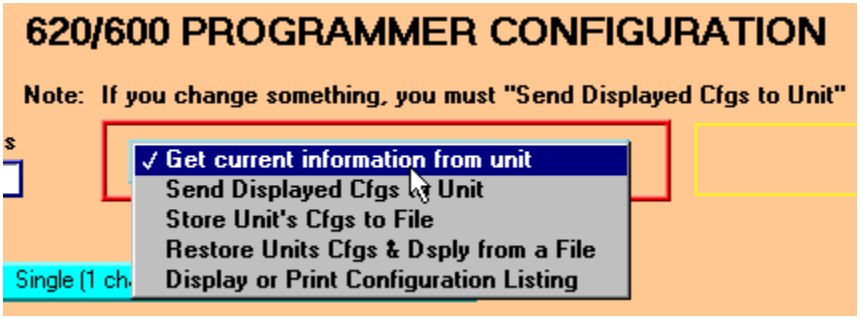
When restoring configurations and PID settings from File, be sure to restore the configurations first then the PIDs. The Configurations set the HI and LOW Span Limits which must be established before the PIDs are restored. If not done in this order, changing the configurations (changing the Span settings will change the Proportional Bands).

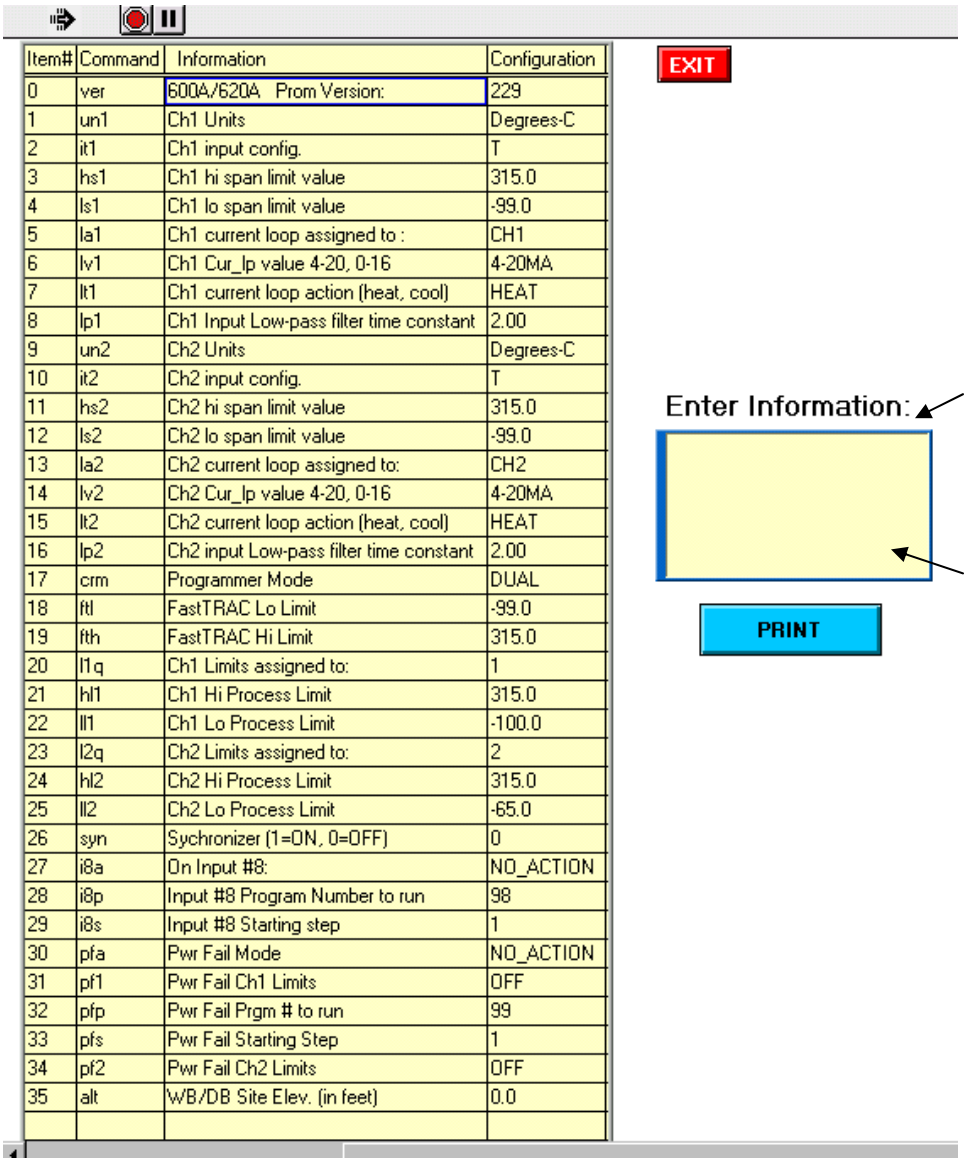
Programmer Configuration:



Note: This screen has seven (7) pull down menus. After you have made you selections, you must send the information to the unit for the configuration changes to take effect.

This is the "blue PULL DOWN menu" Use it to perform actions after you have selected the proper configurations for your applications. Both the Programmer and Controller configurations are saved to file when "Store Unit's Cfgs to File" is clicked from the pull down menu.





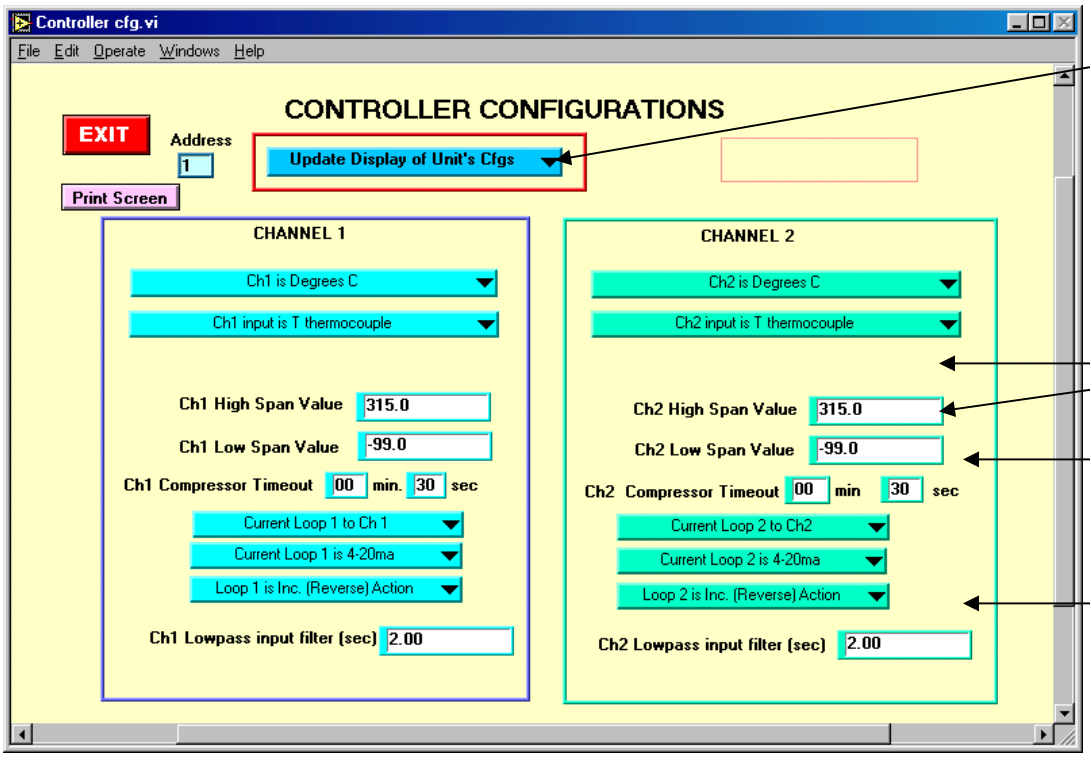
Item#	Command	Information	Configuration
0	ver	600A/620A Prom Version:	229
1	un1	Ch1 Units	Degrees-C
2	it1	Ch1 input config.	T
3	hs1	Ch1 hi span limit value	315.0
4	ls1	Ch1 lo span limit value	-99.0
5	la1	Ch1 current loop assigned to :	CH1
6	lv1	Ch1 Cur_lp value 4-20, 0-16	4-20MA
7	lt1	Ch1 current loop action (heat, cool)	HEAT
8	lp1	Ch1 Input Low-pass filter time constant	2.00
9	un2	Ch2 Units	Degrees-C
10	it2	Ch2 input config.	T
11	hs2	Ch2 hi span limit value	315.0
12	ls2	Ch2 lo span limit value	-99.0
13	la2	Ch2 current loop assigned to:	CH2
14	lv2	Ch2 Cur_lp value 4-20, 0-16	4-20MA
15	lt2	Ch2 current loop action (heat, cool)	HEAT
16	lp2	Ch2 input Low-pass filter time constant	2.00
17	crm	Programmer Mode	DUAL
18	ftl	FastTRAC Lo Limit	-99.0
19	fth	FastTRAC Hi Limit	315.0
20	l1q	Ch1 Limits assigned to:	1
21	hl1	Ch1 Hi Process Limit	315.0
22	ll1	Ch1 Lo Process Limit	-100.0
23	l2q	Ch2 Limits assigned to:	2
24	hl2	Ch2 Hi Process Limit	315.0
25	ll2	Ch2 Lo Process Limit	-65.0
26	syn	Sychronizer (1=ON, 0=OFF)	0
27	i8a	On Input #8:	NO_ACTION
28	i8p	Input #8 Program Number to run	98
29	i8s	Input #8 Starting step	1
30	pfa	Pwr Fail Mode	NO_ACTION
31	pf1	Pwr Fail Ch1 Limits	OFF
32	pfp	Pwr Fail Prgm # to run	99
33	pfs	Pwr Fail Starting Step	1
34	pf2	Pwr Fail Ch2 Limits	OFF
35	alt	WB/DB Site Elev. (in feet)	0.0

This table provides a summary of all of the configurations for the Programmer and both Ch1 and Ch2 Controllers.

Information concerning the chamber or application can be entered here and will be on the print out.

The configuration information can be printed out by clicking on the Print Button

Controller(s) Configuration: Ten (10) Pull Down configuration menu on this screen



Main Pull Down menu

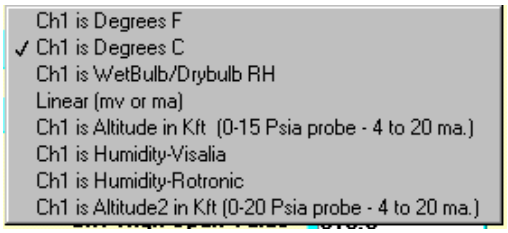
Max Setpoint

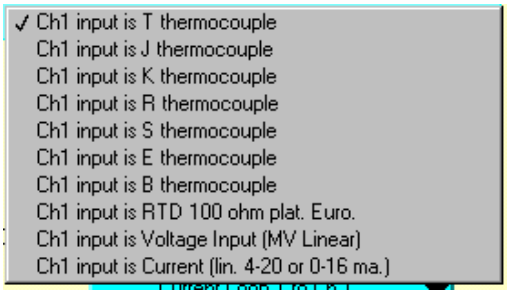
Min Setpoint

MTO setting

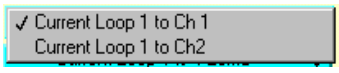
Input filter time constant.

Assign the type of input from this pull down menu

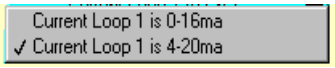




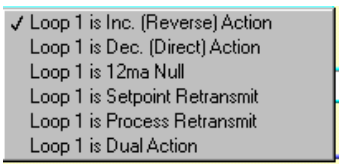
Assign the units from this pull down menu



Assign the current loop (fast D/A) to Ch1 or Ch2. Note: Assign it to Ch2 if unit is a 620A in FastTRAC mode.



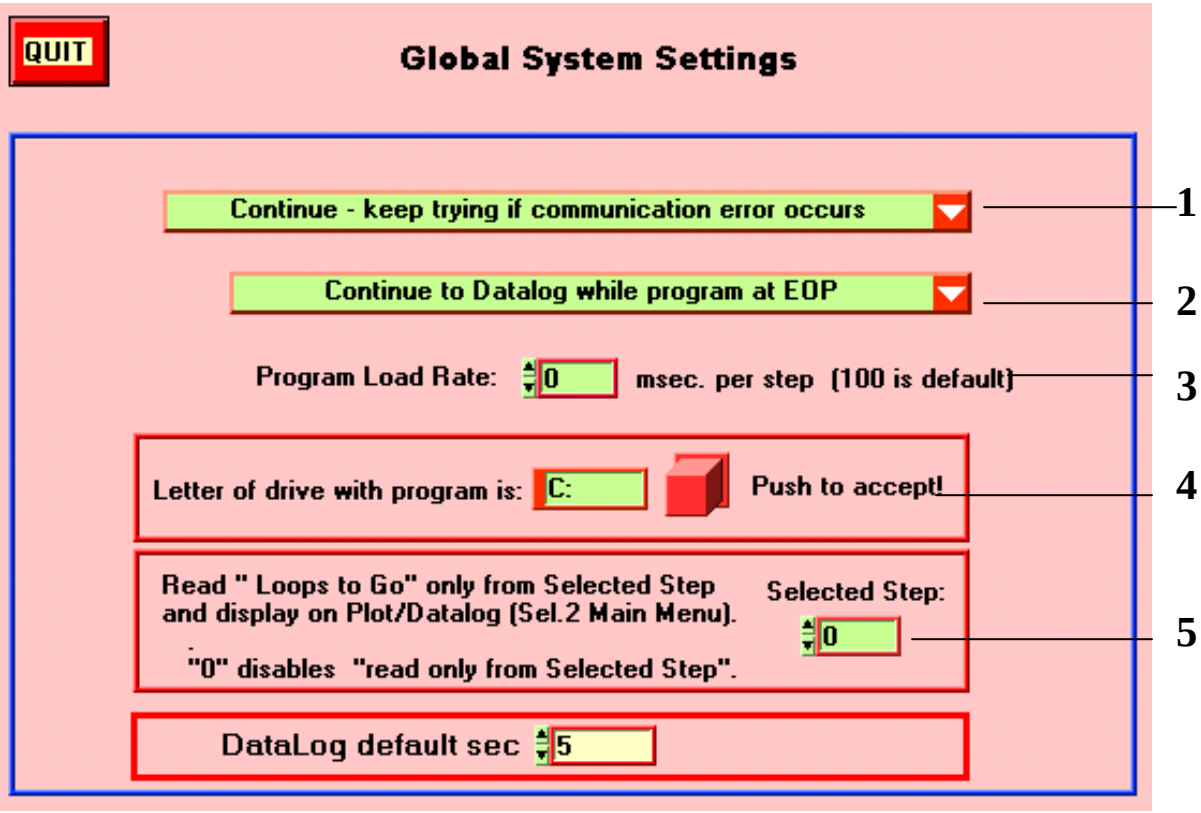
Assignment for built-in recorder current loops



Assignment for Action of Current Loop

Note: Ch2 has it own corresponding set of pull down menus.

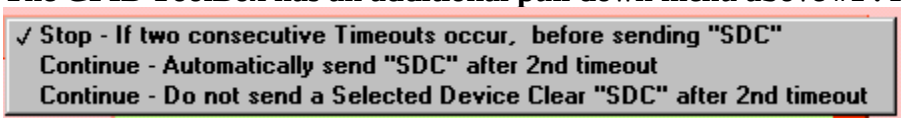
ToolBox Global Settings:



Selections:

1. **In the Serial ToolBox, the choices are: Continue if a communication error occurs, or Stop when the error occurs. Note if the error is from not having the proper address, the current address, followed by NC will show in the address window. (NC means No Connection).**

   The GPIB ToolBox has an additional pull down menu above #1 . It looks like this:

   The SDC is a Selected Device Clear. Only the addressed 600A/620A will re-initialize.

2. **Either Continue to Datalog while the program is at the End Of Program or Quit data Logging when the program is done.**

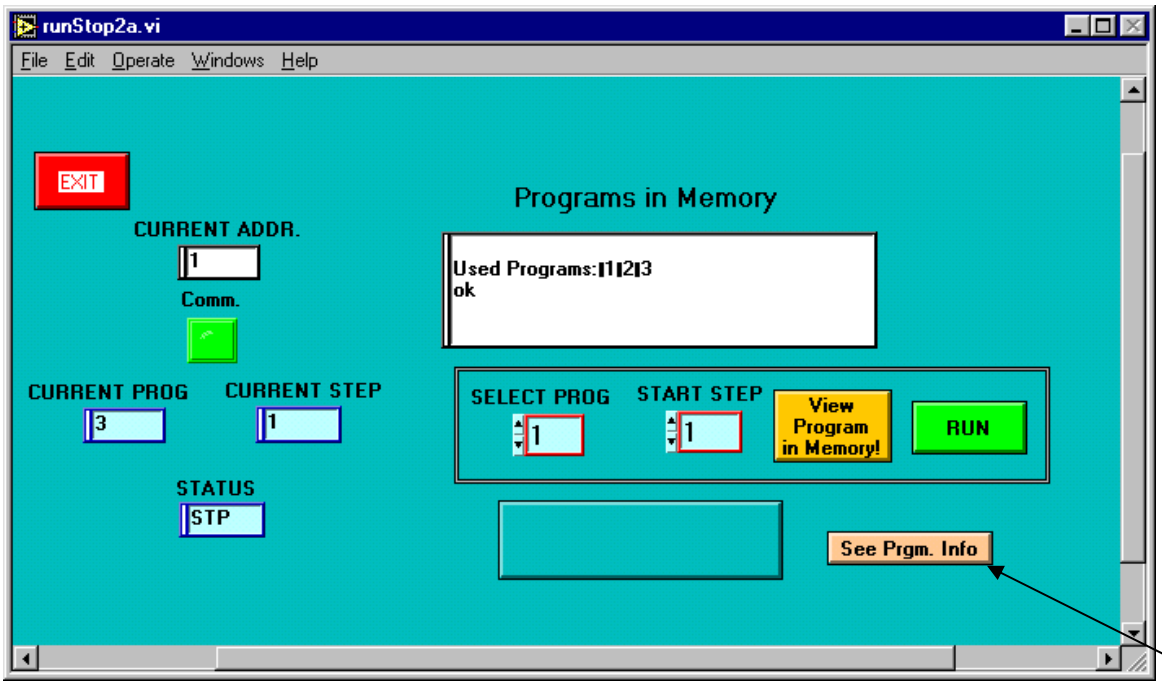
3. **This is a delay between sending each steps information to the unit. The default is 100 mS.**

4. **Drive on which the program resides. Default is drive C.**

5. **Determines which step in the program the "loops to go" is obtained for display**

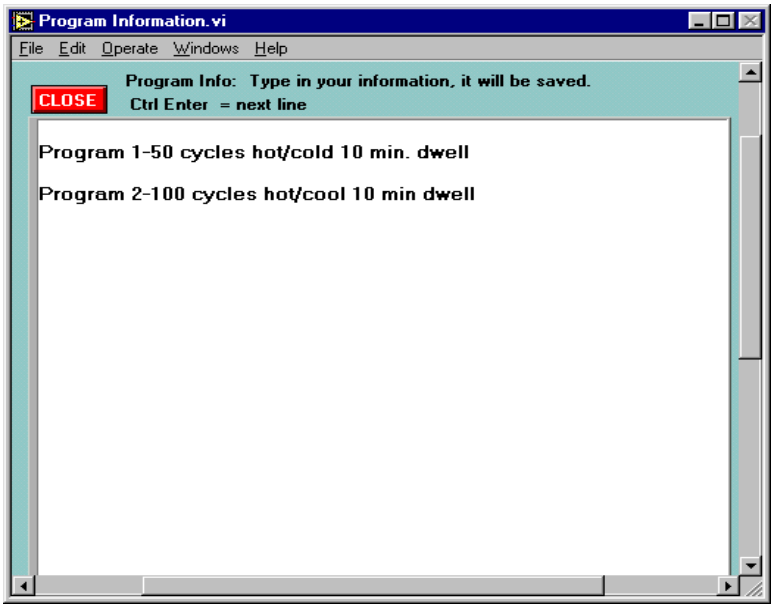
"Operate" menu: This is the Run a "New Program" or step screen –

Use this selection when you are going to run a different program that has already been loaded into the units memory. You can View the Program in Memory before executing it to verify that the program you are about to run is the correct one.



Click on "See Prgm. Info" for Pop-Up info screen

1. **Select the Program to RUN. It must show as one of the Programs in Memory.**
2. **Select the Start Step for the program to start from.**
3. **You can view the program in memory by pushing the "View Program in Memory" button.**
4. **Click on the RUN button to run the program of your choice from the starting step you have selected.**



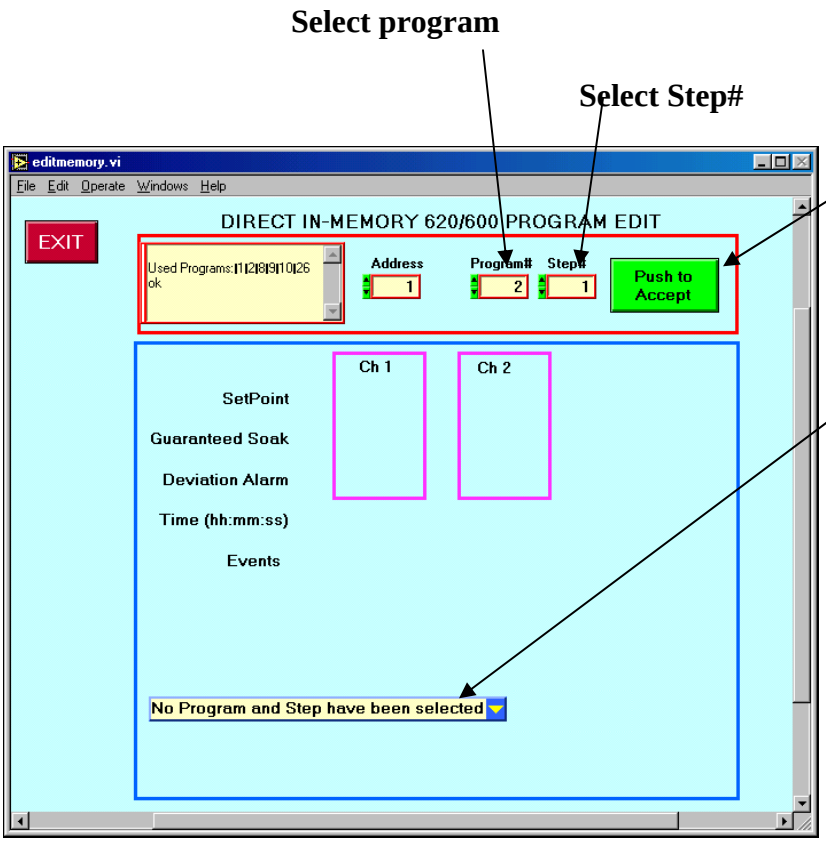
Prgm. Information Pop UP screen.

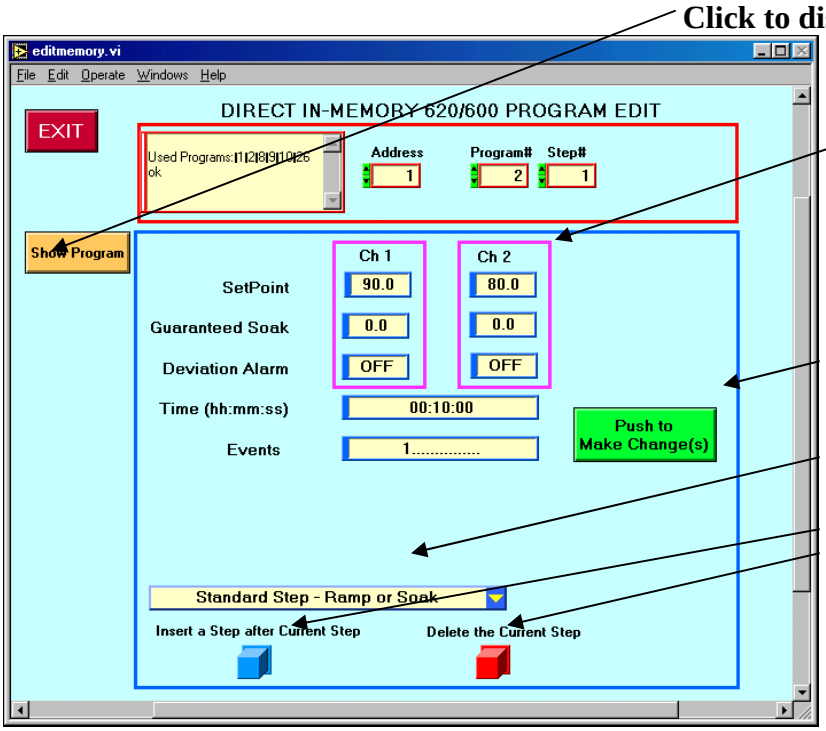
Use the screen to contain information pertaining to individual programs. You can modify the information at any time, make corrections, add new data or delete incorrect data. The corrections or additions are saved automatically when you click on the CLOSE button.
The first time this function is used, the information area will be blank.

Enter useful information about each program you create for your use.

Direct Editing of the Program Stored in the 600A/620A

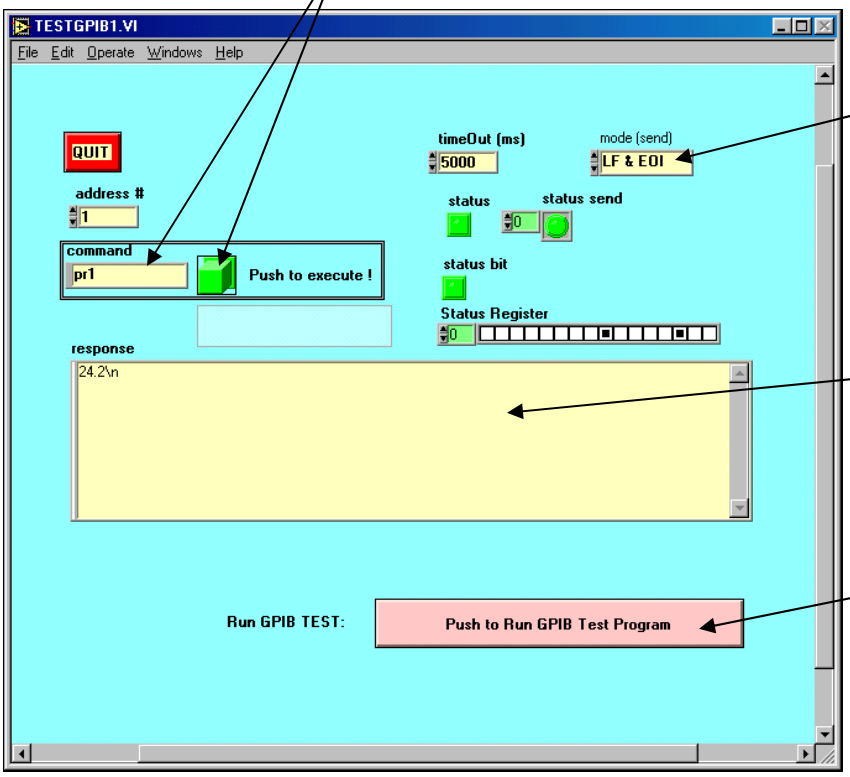
The "Direct Memory Edit (any step)" choice allows you to change the program in memory (on the fly if the program is being executed).





Direct Commands (Send & Recv)

Type command then push green button



Line termination

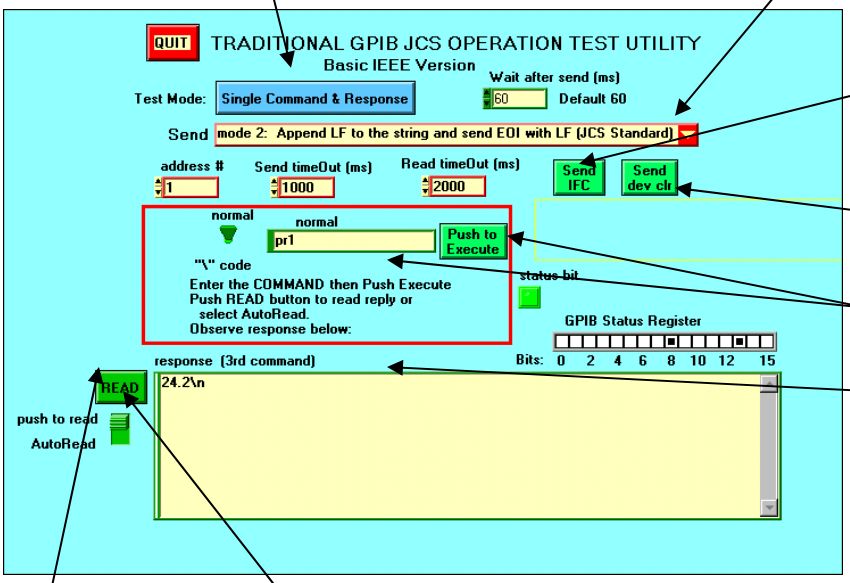
Response from unit shown here

For GPIB Test Pop UP, click here

Note: Serial version does not have GPIB Test Program or Line Termination selections.

Mode of test

GPIB Mode (line termination)



Send Interface Clear Command (hardware)

Send Selected Device Clear Command

Type command and Push To Execute

Display response from unit

Click to read

Select AutoRead or Push to read

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