

A large blue triangle is positioned on the left side of the page, pointing towards the top right corner.

Mini-Circuits' GUI

**ZTS – Series
Solid State Switch Matrices**

A Mini-Circuits Self-Contained Integrated Assembly

Software Manual

Important Notice

This guide is owned by Mini-Circuits and is protected by copyright, trademark and other intellectual property laws.

The information in this guide is provided by Mini-Circuits as an accommodation to our customers and may be used only to promote and accompany the purchase of Mini-Circuits' Parts. This guide may not be reproduced, modified, distributed, published, stored in an electronic database, or transmitted and the information contained herein may not be exploited in any form or by any means, electronic, mechanical recording or otherwise, without prior written permission from Mini-Circuits.

This guide is subject to change, qualifications, variations, adjustments or modifications without notice and may contain errors, omissions, inaccuracies, mistakes or deficiencies. Mini-Circuits assumes no responsibility for, and will have no liability on account of, any of the foregoing. Accordingly, this guide should be used as a guideline only.

Trademarks

Microsoft, Windows, Visual Basic, Visual C# and Visual C++ are registered trademarks of Microsoft Corporation. LabVIEW and CVI are registered trademarks of National Instruments Corporation. Delphi is a registered trademark of Delphi Technologies, Inc. MATLAB is a registered trademark of The MathWorks, Inc. Agilent VEE is a registered trademark of Agilent Technologies, Inc. Linux is a registered trademark of Linus Torvalds. Mac is a registered trademark of Apple Inc. Python is a registered trademark of Python Software Foundation Corporation.

All other trademarks cited within this guide are the property of their respective owners. Neither Mini-Circuits nor Mini-Circuits test systems are affiliated with or endorsed or sponsored by the owners of the above referenced trademarks.

Mini-Circuits and the Mini-Circuits logo are registered trademarks of Scientific Components Corporation.

Mini-Circuits

13 Neptune Avenue

Brooklyn, NY 11235

Phone: 1-718-934-4500

Email: sales@minicircuits.com

Web: www.minicircuits.com

Table of Contents

1	INTRODUCTION	4
2	Software Installation	4
2.1	Download Links	4
2.2	Installation Steps	4
3	Mini-Circuits' GUI	4
3.1	Connecting to the System.....	4
3.1.1	Connecting to Your Unit	5
3.2	Main Screen	5
3.2.1	System Options	6
3.2.2	Unit Information	6
3.2.3	Switch Status	6
3.2.4	Switch Control	7
3.2.5	Manual Commands	7
3.2.6	Ethernet Settings.....	8
3.2.7	User Profile Management.....	9
3.2.8	User Profile Configuration	10
3.2.9	Switch Sequence.....	11

1 INTRODUCTION

Thank you for choosing Mini-Circuits custom test equipment to meet your needs! The purpose of this Software Manual is to instruct you on installation and use of the Mini-Circuits' software that comes with your equipment.

We're here to support you every step of the way. For technical support and assistance, please find the following points of contact for your convenience:

Test Solutions Department
Mini-Circuits Laboratories
Email: TestSolutions@minicircuits.com

2 Software Installation

2.1 Download Links

You can download the software for the ZTS - Series on the Mini-Circuits website found here:

<https://www.minicircuits.com/softwaredownload/multissw.html>

The GUI Software download includes only the Setup.exe and supporting files for installation of the GUI.

The Full Software Package includes the GUI Software, .NET and ActiveX DLLs, ReadMe Files, and SCPI Lists for controlling the product.

2.2 Installation Steps

1. Unzip the downloaded .zip folder
2. Double click on the Setup.exe file or Install.exe file depending on your download selection
3. Simply follow the prompts to install the software
 - a. You will need to indicate where you wish to install the program
4. After installation, a shortcut will be made on your desktop and in your start menu under the Mini-Circuits folder

3 Mini-Circuits' GUI

3.1 Connecting to the System

When you first open the program, you'll be asked to log in to your profile. If this is the first time you're accessing your equipment, the Admin profile is the only existing profile and there is no password. Simply press on **Start** to get started.

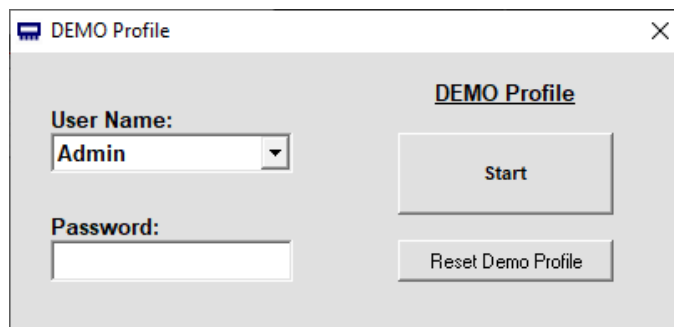


Figure 1: Login Screen

3.1.1 Connecting to Your Unit

Once you've logged in, press on the **Serial Number** dropdown and then select the serial number of your unit. If you wish to connect via USB, your serial number should have - **USB** as part of the selection.

If you wish to connect via Ethernet, your serial number should have - **IP** as part of the selection. An *Ethernet Configuration* window will also prompt asking for the IP (this should be automatically filled in), the password if you've set one, and also what protocol to connect. Depending on your unit you can connect via HTTP, Telnet, or SSH (if available in your model).

If you are connecting via SSH, there is also a SSH Login Name that you will need to provide.

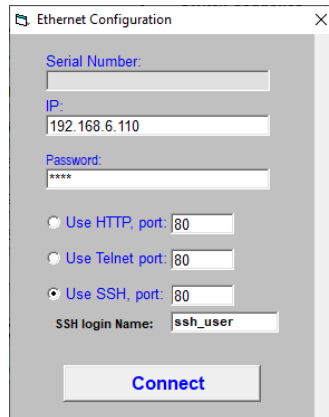


Figure 2: Ethernet Configuration Prompt

3.2 Main Screen

When you successfully connect to the unit the *Main Screen* will appear. The various sections of the main screen are displayed below in Figure 3.

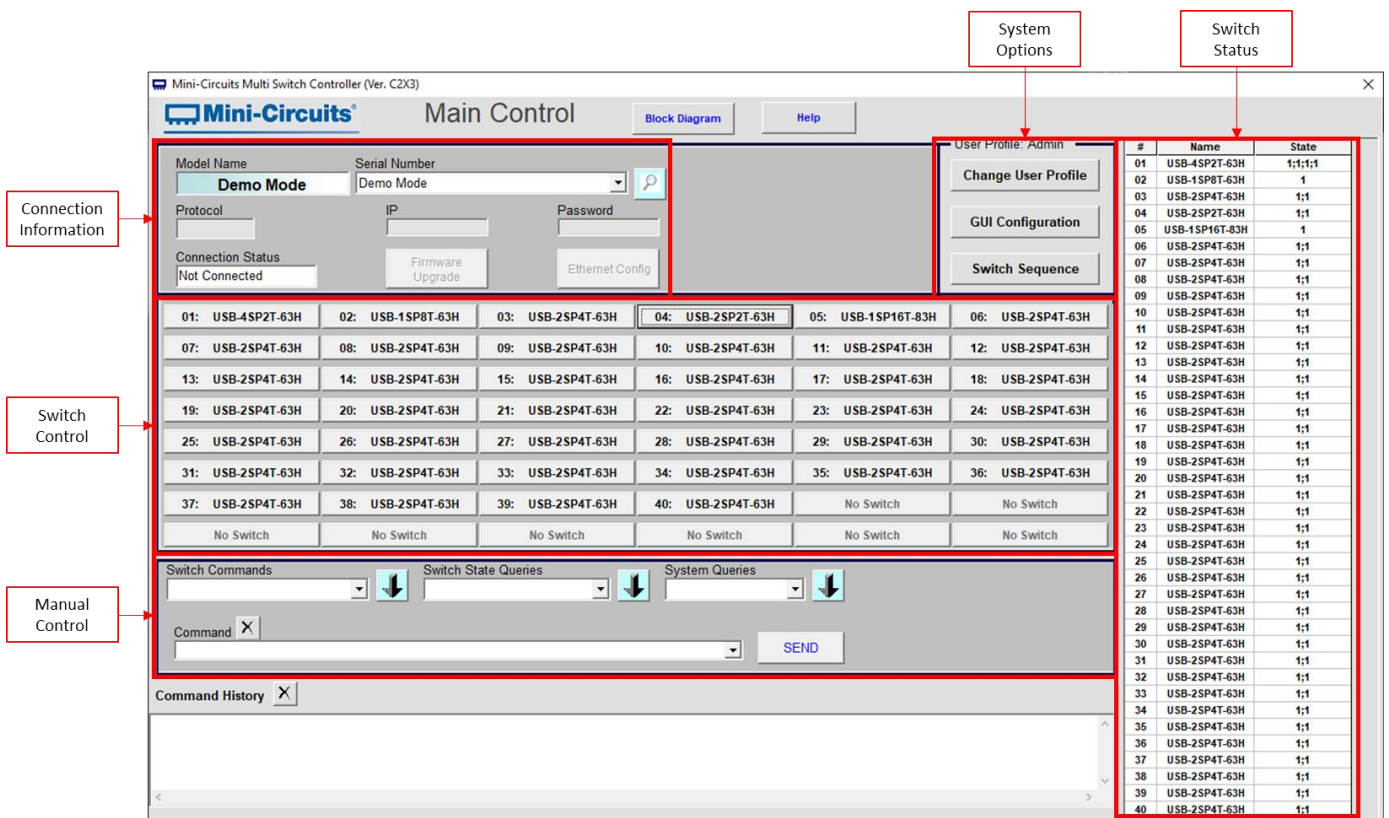


Figure 3: Main Screen

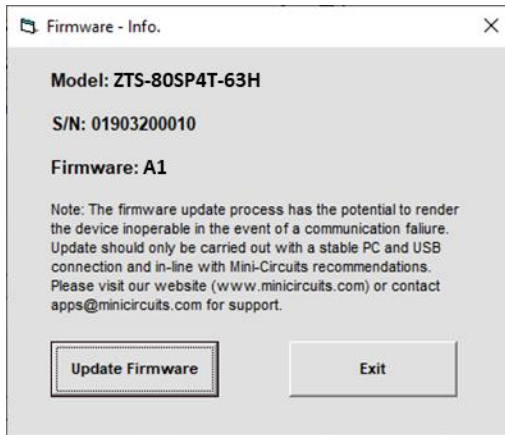
3.2.1 System Options

- **Change User Profile** - Relaunches the initial login screen so you can login as a different profile
- **GUI Configuration** - Opens the *User Profile Management* window
- **Switch Sequence** - Opens the *User Sequence* window

3.2.2 Unit Information

This section simply lists the Model Name, Serial Number of the master unit (if there is one), the Connection Type. If the connection is HTTP, Telnet, or SSH, it'll also include the IP Address and the port that it's connecting through.

This is also the section where you choose the unit you connect to and the method in which you connect to it.



The **Firmware Upgrade** button opens up the window on the left. Here you'll find various information including the model name, serial number, and the firmware revision of the Master unit. You can also update the firmware here by clicking on **Update Firmware** and then finding the firmware file (.hex) and then pressing **O.K.** You can only update the firmware via USB.

Please contact Mini-Circuits (TestSolutions@minicircuits.com) for the latest firmware.

Important: While the firmware is updating, DO NOT disconnect the USB. Doing so will corrupt the unit.

Figure 4: Firmware Upgrade

3.2.3 Switch Status

This section displays the states of each module that is connected. If a module has multiple switches in it (ex. USB-4SP2T-63H has 4x SP2Ts inside) the State would display 4 numbers, each separated by a semi colon (;).

The # reflects the address of the module. Each ZTS makes use of a control board which uses address 00 and then each connected module takes a subsequent number. When daisy chaining multiple ZTS units the control board of each ZTS will take an address and then it's switches will take the subsequent addresses.

For example, if you were to daisy chain three ZTS-3SP8T-63H the addresses will be assigned as displayed in Table 1. ZTS-3SP8T-63H stands for the control board address.

Table 1: Address Assignment

#	Name	State
01	USB-1SP8T-63H	1
02	USB-1SP8T-63H	2
03	USB-1SP8T-63H	3
04	ZTS-3SP8T-63H	
05	USB-1SP8T-63H	4
06	USB-1SP8T-63H	5
07	USB-1SP8T-63H	6
08	ZTS-3SP8T-63H	
09	USB-1SP8T-63H	7
10	USB-1SP8T-63H	8
11	USB-1SP8T-63H	1

3.2.4 Switch Control

This is where you'll control the unit. Here you'll find a table of buttons corresponding to the number of switch modules you have within your unit. To control a module, simply press on the module you wish to control and then a new window will appear with buttons corresponding to the ports of that module. Simply press on the port number you wish to switch to and that will change the state of the switch.

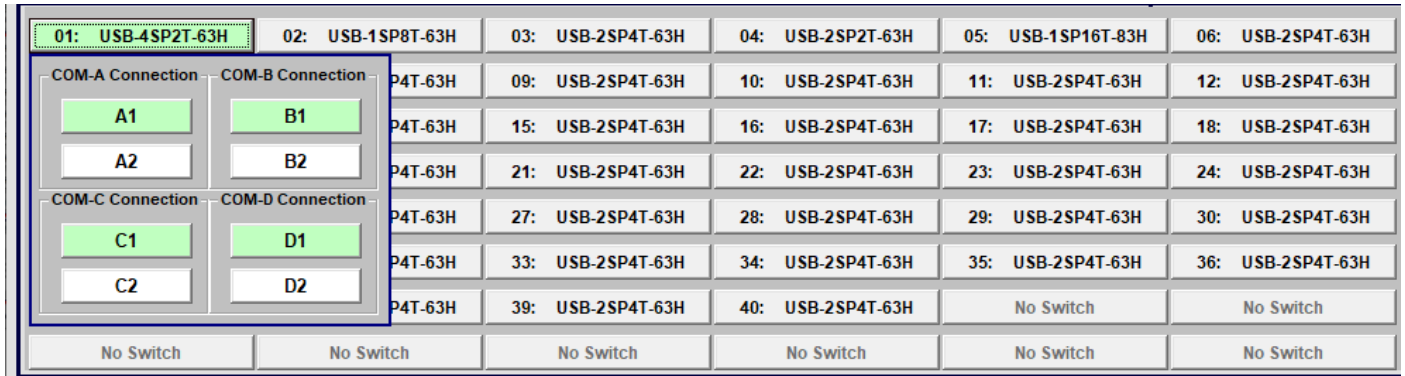


Figure 5: Switch Control

3.2.5 Manual Commands

This is where you can send commands manually. You can either select the specific command you want from the three dropdowns and then press on the down arrow button to bring it into the *Command* area. To send the command simply press **Send**. To clear the command in the *Command* area just press on the **X**. The *Command* area is also a dropdown holding onto the most recent commands you've sent.

For a list of possible commands please look into the ReadMe file that comes with the full software package download.

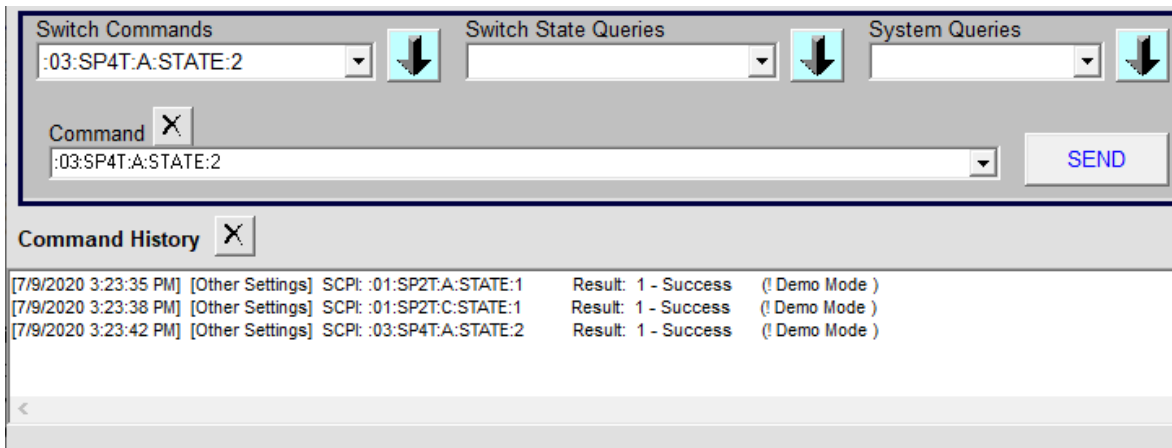


Figure 6: Manual Commands & Command History

3.2.6 Ethernet Settings

All ZTS models are configured with DHCP enabled by default so in most cases a dynamic IP address will be issued by the network's DHCP server on connection. If you wish to change the system's Ethernet configuration (assign a static IP address for example) then you'll need to connect the system via USB and click on the GUI's **Ethernet Settings** button to bring up the Ethernet Device - Configuration window.

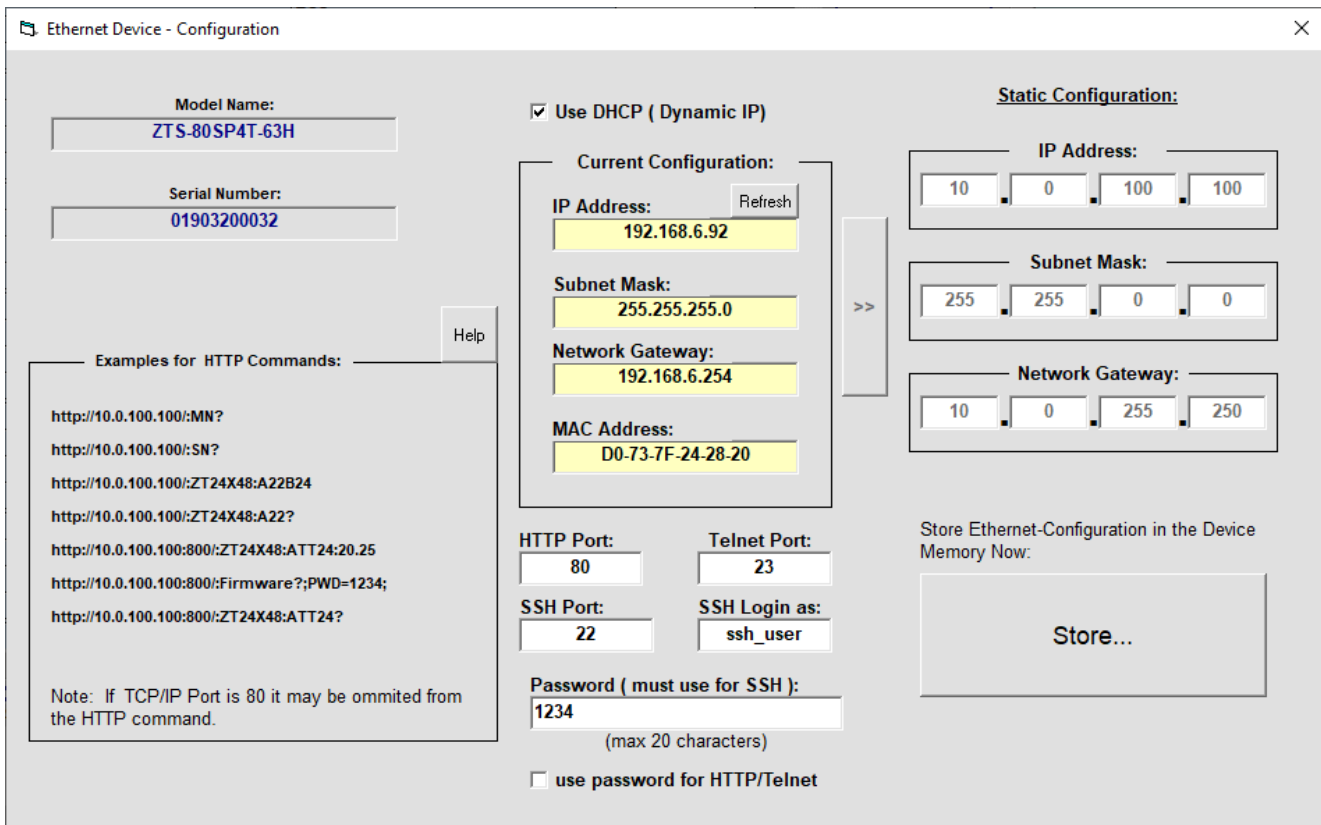


Figure 7: Ethernet Configuration

In this window you can either select DHCP or set a static configuration. If DHCP is enabled but the IP Address in the Current Configuration section states "0.0.0.0" it indicates that the system has not yet been assigned an IP address by the network; wait a moment and then click on **Refresh** to try again. Press on **Store...**, will also update the configuration and also save the settings. If an IP address still cannot be retrieved, please check the Ethernet connection and consult your network administrator.

The Ethernet configuration screen also allows you to change the HTTP, Telnet, and SSH ports of the connection. You can also input a password to be used when connecting. The password is optional for HTTP/Telnet so you'll have to enable it with the check box. For SSH, a login and password are mandatory. Whenever you connect via SSH you must input the correct login and password.

Once everything is properly set, press on **Store...** to save your settings.

3.2.7 User Profile Management

Press on the *GUI Configuration* button to open up the User Profile Management section.

The Admin can use this section to create and edit different profiles for different users.

Initially you'll have to save the permissions file somewhere on your computer. Press on *New* to save the current permissions file. By default, there should only be the Admin profile with no password and access to all serial numbers (all units of the same model). To create new profiles, press on the *Add New User* button. You'll be prompted to enter a username and password for this user.

The permissions file will automatically be called when the GUI opens as long as the computer has access to the file location. If the file is saved onto a computer, but then the unit is moved and connected to a different computer then a new permissions file needs to be created.

In the example in Figure 8, a new profile was created with the Profile Name "Wallace" and the password "Tester".

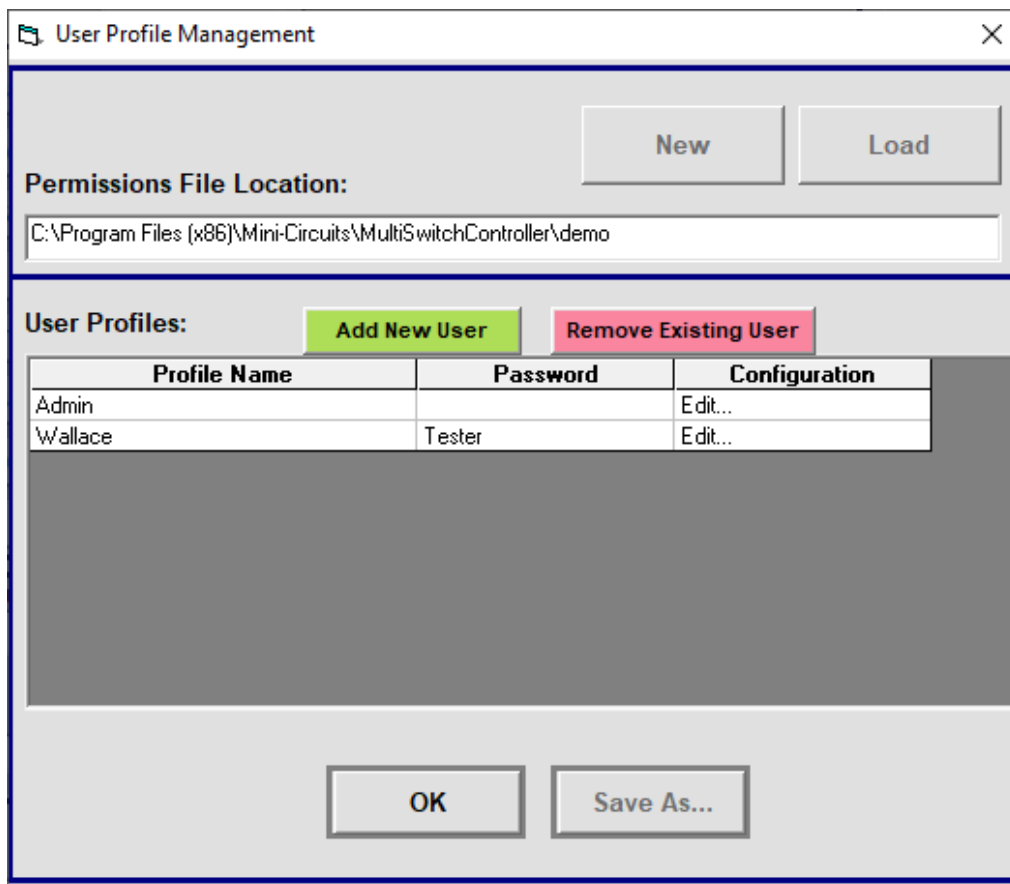


Figure 8: User Profile Management

3.2.8 User Profile Configuration

You can edit the access of each profile. By default, each profile has access to all ports of the unit. The Admin can change this by clicking on *Edit...* next to the profile under the *Configuration* column. Simply press on “Yes” or “No” under the *Switch Active?* column of the switch module to either give or take away access.

This is also where you can edit the name of each switch modular and port. Simply select the switch or port you wish to change the name of and type in your desired name. You can also set the initial state for each switch. Simply press on the *Initial State* ** section of the switch you wish and then select the starting states of the module using the drop downs and then press *Save*.

You can also permit the user to send manual commands or not by simply clicking on the check box at the top of the window.

Edit User Profile: Wallace

User profile permitted to send manual commands

Save Cancel

Switch Number	Switch Label	Switch Active?	Initial State **	Switch State / Port Label							
				Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
1	USB-4SP2T-63	Yes	-1,-1,-1,-1	A1	A2	B1	B2	C1	C2	D1	D2
2	4SP2T					J3	J4	J5	J6	J7	J8
3						A3	A4	B1	B2	B3	B4
4						B1	B2				
5						J3	J4	J5	J6	J7	J8
6						A3	A4	B1	B2	B3	B4
7						A3	A4	B1	B2	B3	B4
8	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
9	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
10	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
11	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
12	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
13	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
14	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
15	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
16	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
17	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
18	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
19	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
20	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
21	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
22	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
23	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
24	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
25	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
26	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
27	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
28	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4
29	USB-2SP4T-63H	Yes	-1,-1	A1	A2	A3	A4	B1	B2	B3	B4

** State 1 = No change to the current Switch State

Figure 9: User Profile

3.2.9 Switch Sequence

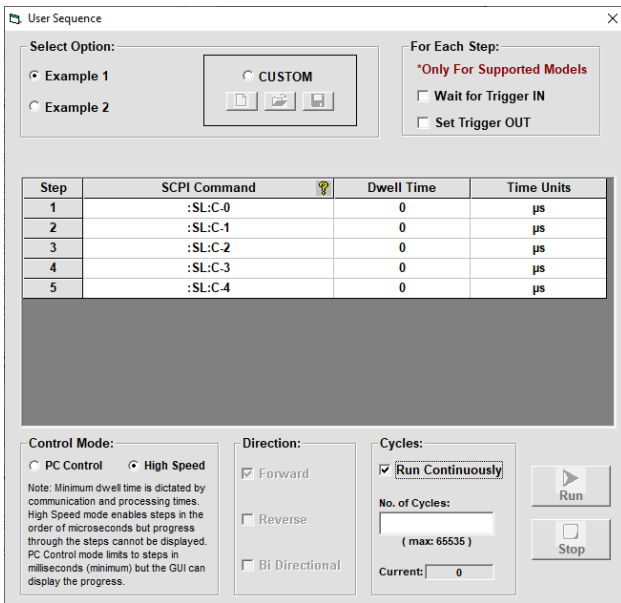


Figure 10: Switch Sequence

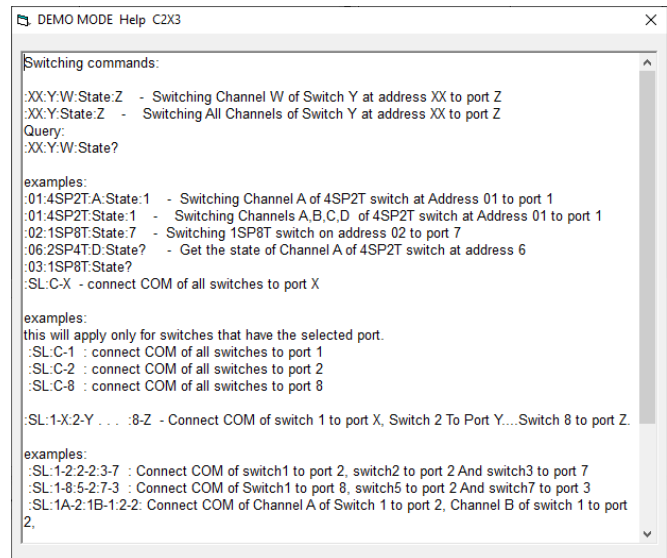


Figure 11: Sequence Help

Switch Sequence is where you can create specific sequences of commands for the switches. For each step, you'll enter the SCPI Command and the Dwell Time that you wish to send to the unit. A list of SCPI Commands can be found in the Programming Manual as well as by clicking the "?" icon next to "SCPI Command". The "?" icon brings up the help window shown above.

There are some pre-defined examples on the top left and also a "Custom" section allowing you to create your own. Remember to save the sequence if you wish to re-use it at a later date, simply press the floppy disk button. To load, press the open folder button. To create a new sequence, you can press the blank page button to clear the steps.

The SCPI Command section can include multiple commands, up to a total of 60 characters. For example, you the following command could be entered as Step 1 to set only the first three SP8Ts to State 1:

```
:01:SP8T:STATE:1;;02:SP8T:STATE:1;;03:SP8T:STATE:1;
```

On the top right, you can select the options to allow for a Trigger In and Out. When "Wait for Trigger IN" is checked, each step will wait for a trigger in signal before proceeding. When "Set Trigger OUT" is checked, each step will send a trigger out signal after completion of the step.

PC Control allows the GUI to indicate which step is currently active, however this limits the minimum dwell time for each step in the order of ms (dictated by the USB / Ethernet communication time). High Speed control mode allows for μs dwell times but the GUI cannot update while this mode is in operation, meaning that you won't be able to follow the switch sequence on screen.

Direction simply tells the unit in which way to implement each step. Forward goes through the steps as 1, 2, 3, 4, while Reverse goes through the steps as 4, 3, 2, 1. Bi Directional sets the steps running as 1, 2, 3, 4, 3, 2, 1, 2, 3, 4.

You can make the sequence run continuously, or set the number of cycles you want to iterate in the Cycles portion of the window. You can also run each step manually by double clicking the specific step you wish to initiate.