Simple Step LLC

Simple Step™

Windows Control Manual (SSWin32)

Version 1.1.9

12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

Contents

12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

Description

This manual will describe the breakdown of the command syntax used within the ***Simple Step***™ Windows Control Program. This software will allow the user to control a set of ***Simple Step***™ Boards via a standard text editor.

The ***Simple Step***™ Windows Control Panel is a program that reads a standard text file from the hard drive. The program will interpret the text file and convert it into actual commands used for each of the ***Simple Step***™ Boards connected to serial network.

Detailed Command Descriptions

ssend

This command will send a formatted command text to the serial port. The parameters passed with this command are just the command string. No formating of the text string is performed before sending it to the serial port. The software automatically appends a carriage return to the end of all strings sent to the serial port. The SSWin program will wait for an acknowldgment.

ssendna

This command will send a formatted command text to the serial port. The parameters passed with this command are just the command string. No formating of the text string is performed before sending it to the serial port. The software automatically appends a carriage return to the end of all strings sent to the serial port. The SSWin program will not wait for an acknowldgment.

sscb

This command will send a formatted command text down to the SSCB board. The parameters passed with this command are the SSCB board address (0-15) and the command string. The software will automatically format the structure of the output string so that the SSCB will act on it. The software automatically appends a carriage return to the end of all strings sent to the SSCB modules.

set_sscb_position

This command collects the information from the temp register (specified as a parameter) that has been set via the SSQE ‘P’ or ‘p’ commands. This command will then send down to the SSCB board a ‘A’ command to set the current position. The user can then command the SSCB board to go to the position originally intended.

sscb_check_done

This command checks to see if the SSCB board addressed has completed its motor movement command. If not, the SSWin program will jump to one of the two programmed addresses. The first address specifies the jump address if the motor has completed its operation or the second address if it is busy.

wait_sscb_done

This software command checks to see if the SSCB board being addressed has completed a motor movement before continuing on to the next instruction.

12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

wait_sscb_response

This software command checks to see if the SSCB board has sent a response back. This instruction is used for autoreponse commands like the motor movement complete status ('f'). The parameters passed with this command are the SSCB board address (0-15).

ssmicro

This command will send a formatted command text down to the SSMicro board. The parameters passed with this command are the SSMicro board address (0-15) and the command string. The software will automatically format the structure of the output string so that the SSMicro will act on it. The software automatically appends a carriage return to the end of all strings sent to the SSMicro modules.

set_ssmicro_position

This command collects the information from the temp register (specified as a parameter) that has been set via the SSQE 'P' or 'p' commands. This command will then send down to the SSMicro board a 'A' command to set the current position. The user can then command the SSMicro board to go to the position originally intended.

ssmicro_check_done

This command checks to see if the SSMicroboard addressed has completed its motor movement command. If not, the SSWin program will jump to one of the two programmed addresses. The first address specifies the jump address if the motor has completed its operation or the second address if it is busy.

wait_ssmicro_done

This software command checks to see if the SSMicro board being addressed has completed a motor movement before continuing on to the next instruction.

wait_ssmicro_response

This software command checks to see if the SSMicro board has sent a response back. This instruction is used for autoreponse commands like the motor movement complete status ('f'). The parameters passed with this command are the SSMicro board address (0-15).

sscbhc

This command will send a formatted command text down to the SSCB-HC board. The parameters passed with this command are the SSCB-HC board address (0-16) and the command string. The software will automatically format the structure of the output string so that the SSCB-HC will act on it. The software automatically appends a carriage return to the end of all strings sent to the SSCB modules.

set_sscbhc_position

This command collects the information from the temp register (specified as a parameter) that has been set via the SSQE 'P' or 'p' commands. This command will then send down to the SSCB-HC board a 'A' command to set the current position. The user can then command the SSCB-HC board to go to the position originally intended.

12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

sscbhc_check_done

This command checks to see if the SSCB-HC board addressed has completed its motor movement command. If not, the SSWin program will jump to one of the two programmed addresses. The first address specifies the jump address if the motor has completed its operation or the second address if it is busy.

wait_sscbhc_done

This software command checks to see if the SSCB-HC board being addressed has completed a motor movement before continuing on to the next instruction.

wait_sscbhc_response

This software command checks to see if the SSCB-HC board has sent a response back. This instruction is used for autoreponse commands like the motor movement complete status ('f'). The parameters passed with this command are the SSMicro board address (0-15).

ssxyz

This command will send a formatted command text down to the SSXYZ board. The parameters passed with this command are the SSXYZ board address (0-15) and the command string. The software will automatically format the structure of the output string so that the SSXYZ will act on it. The software automatically appends a carriage return to the end of all strings sent to the SSXYZ modules.

set_ssxyz_position

This command collects the information from the temp register (specified as a parameter) that has been set via the SSQE 'P' or 'p' commands. This command will then send down to the SSXYZ board an 'A' command to set the current position. The user can then command the SSXYZ board to go to the position originally intended. The second parameter is which motor (X,Y,Z) to change.

check_ssxyz_done

This command checks to see if the SSXYZ board addressed has completed its motor movement command. If not, the SSWin program will jump to one of the two programmed addresses. The first address specifies the jump address if the motor has completed its operation or the second address if it is busy.

wait_ssxyz_done

This command will wait until the last command to the SSXYZ is completed before returning to the Windows program. The parameters passed with this command is the SSXYZ address (1-8), followed by a single character of the following table:

'A'	Wait for X,Y, and Z systems to complete their last operation.
'X'	Wait for the X motor to complete its last operation.
'Y'	Wait for the Y motor to complete its last operation.
'Z'	Wait for the Z motor to complete its last operation.

12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

wait_ssxyz_response

This software command checks to see if the SSXYZ board has sent a response back. This instruction is used for autoreponse commands like the motor movement complete status ('f'). The parameters passed with this command is the SSXYZ address (1-8), followed by a single character of the following table:

'A'	Wait for X,Y, and Z systems to complete their last operation.
'X'	Wait for the X motor to complete its last operation.
'Y'	Wait for the Y motor to complete its last operation.
'Z'	Wait for the Z motor to complete its last operation.

ssqe

This command will send a formatted command text down to the SSQE board. The parameters passed with this command are the SSQE board address (0-16) and the command string. The software will automatically format the structure of the output string so that the SSQE will act on it. The software automatically appends a carriage return to the end of all strings sent to the SSQE modules. In most cases, commands are not sent down to the SSQE Board if a link_me command is used. The SSWin Program will automatically query the SSQE Board that is linked to the motor and check to see if the motor has reached the pre-programmed target. When a SSQE board is queried, the SSWin program copies the encoder values into a set of temp registers (41-72). The user can then use the temp commands to make decisions on how to use the information to correct motor movement. The user must understand that the encoder board returns a long integer and the motor boards uses an unsigned integer.

link_me

This command links the motor board with the encoder board. Several parameters are used to perform this operation. Once the motor and encoder are linked with each other, the SSWin program will automatically compare and correct ALL motor movements after the original motor movement has been performed. This only occurs if the encoder position is out of tolerance with the targeted motor position that the user is trying to move to. The parameters are as follows:

1 - Motor board number (0-16)
2 - Motor Type (X,Y,Z,S) (S=SSCB)
3 - Encoder board number (0-16)
4 - Encoder Channel (0 or 1)
5 - Encoder Active (0) or Not Active (1)
6 - Encoder Retry (0-255)
7 - Encoder Plus Tolerance (0-255)
8 - Encoder Negative Tolerance (0-255)

sdelay

This command will wait the user's set seconds before continuing. The parameter is from 1 second to 65,534 seconds.

delay

This command is just like the sdelay command but increments are in milliseconds. The parameter range is from 1 millisecond to 65,534 milliseconds.

12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

user_wait

This command will display a Windows dialog box. There will only be one (1) button within the dialog box named “OK”. The user must click on the button for two (2) things to occur. The first is that the dialog box will be removed and the second is the continuation of the rest of the commands.

user_input

This command will allow the user to create custom Windows Dialog box’s with particular buttons and message string. The button action then allows the user to jump to different address’s within the program. The first parameter is the Dialog type (0-5). The following parameters depend on the dialog type. Some Dialog’s have only one (1) button, and others have three (3). The list is as follows:

Dialog #0	Just an OK button. Program goes to next instruction once the button is clicked.
Dialog #1	OK and Cancel buttons. This has two (2) address parameters.
Dialog #2	YES and NO buttons. This also has two (2) address parameters.
Dialog #3	YES, NO, and CANCEL buttons. This has three (3) address parameters.
Dialog #4	RETRY and CANCEL. This has two (2) address parameters.
Dialog #5	ABORT, RETRY, and IGNORE buttons. This has three (3) address parameters.

set_temp

This command allows the user to set a temp register to some value from 0 to 65,535.

inc_temp

This command increments a temp register by a user defined value.

dec_temp

This command decrements a temp register by a user defined value.

compare_temp

This command compares the temp register to a specified value. There are three (3) parameters used to specify the conditions to jump and where. These are: if the value is less than, equal to, and greater than. The compare value is a number from 0 to 65,535. The address is from 1 to 400. A zero (0) address specifies: to continue to the next instruction.

move_resp_temp

This command performs a movement between a special holding register and a user defined temporary register. When a command is given to a Simple Step board, the response is checked to see if it has a numbered response after the status response. If a number is found the SSWin software converts it to a number and saves it into a special response holding register. This command allows the use to move the numbered response from the holding register to a temporary register (1-40). This allows the user to then make decitions on the response from the board. Example: Host: “D0I4”, Board:“d0>00001”, SSWin:”move_resp_temp to temp. reg. #1”. Now the temporary register has the number 1 in it.

12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

move_temp_temp

This command allows the user to move any temporay register (1-72) to any other temporary register (1-72).

loop

The loop command only has one function which is to jump back to a user specified address. The address range is from 1 to 200.

cloop

The cloop command is like the loop command but with an extra user parameter. The first parameter is the count to decrement down from (to zero) and the second is the loop address to jump to until the counter reaches the zero value. The address range is from 1 to 200 and the count range is from 1 to 65,534.

enable_comm_debug

This command automatically enables the communications debugger window.

disable_comm_debug

This command disables the communications debugger window. It will not shut the window down, but stop data logging communications until another "enable_comm_debug" is encountered.

enable_qe_data_logger (1.3.9 and greater)

This command enables the SSQE/ SSXYQE data logger mode. This command allows the user to data log all incoming 'p' and 'P' command responses to a file called "qe.dat". It will allow the user to look at actual positions read back from the quadrature encoder interface so that it can be used as a way of determining motor positions for later program writting. The "qe.dat" file is over written every time this command is issued. This file is closed when either the "disable_qe_data_logger" command si issued, the "STOP" button is depressed, or when a used Escape key is depressed.

pause_qe_data_logger (1.3.9 and greater)

This command pauses the SSQE/SSXYQE data logger mode. It does not close the "qe.dat" file, but disables the communications logger flags so that data logging can commence at any time.

disable_qe_data_logger (1.3.9 and greater)

This command closes the "qe.dat" file and disables all communication hooks for SSQE/SSXYQE command responses.

end_program

This command tells the software that this is the end of the user program. The Windows program will return for the user to select another program or quit the software program.

12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

EEPROM Programming (F)ile command (1.3.9 and Greater)

This is a new section of the SSWin program. It allows the user to program a board that has the Internal EEPROM option installed. Since this is a rather new section of the SSWin program, there are still some major enhancements that need to be added before we feel that this section is up to Magna standards. The programmer is also currently limited to programming the onboard EEPROM if this is the ONLY board on the network. This will be upgraded to network programming as soon as we can work out a complete interface protocol.

The EEPROM Programming interface works like the SSWin Program Editor interface. Adding and editing a file has all or most of the user interface that is found in the standard editor. Line numbers always start at line 1 (we will upgrade this at a later time to allow programming other sections of EEPROM space). Even though the user can store a program anywhere in the 2K (2047) locations of EEPROM memory, the SSWin editor interface is currently limited to displaying lines number starting from position #1. The (O)perations menu command allows the user to perform the following commands:

1) Load a program from disk.
2) Save a program from disk.
3) Read a program from the onboard EEPROM.
4) Write a program to the onboard EEPROM.
5) Erase all program memory.
6) Run a onboard program.

12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

Command Table

Command	Param1	Param2	Param3	Param4	Param5	Param6	Param7	Param8	Description
user_wait									Wait for user to click OK button to continue.
user_input	0	Command							Wait for user to click OK button but display Command message when creating window.
user_input	1	Command	Ok Address	Cancel Address					Wait for user to click OK or CANCEL button but display Command message when creating window.
user_input	2	Command	Yes Address	No Address					Wait for user to click YES or NO button but display Command message when creating window.
user_input	3	Command	Yes Address	No Address	Cancel Address				Wait for user to click YES, NO, or CANCEL button but display Command message when creating window.
user_input	4	Command	Retry Address	Cancel Address					Wait for user to click RETRY or CANCEL button but display Command message when creating window.
user_input	5	Command	Abort Address	Retry Address	Ignore Address				Wait for user to click ABORT, RETRY, or IGNORE button but display Command message when creating window.
set_temp	Register	Count							Set Temp Register x to Count value.
inc_temp	Register	Count							Increment Temp Register x by Count value.
dec_temp	Register	Count							Decrement Temp Register x by Count value.
compare_temp	Register	Count	Less than Address	Equal to Address	Greater than Address				Compare Temp Register x by Count and jump to the correct Address if <,=,>
move_resp_temp	Register								Move Board response from special holding register to a user defined temporary register (1-40).
move_temp_temp	Register	Register							Move a temporary register (1-72) to another temporary register (1-72).
ssend	None	Command							Send a command to the serial port with no formating performed. An ack. will be expected from the boards connected to the serial port.
ssendna	None	Command							Send a command to the serial port with no formating performed. No ack. will be expected.
sscb	Board Address	Command							Send command to SSCB at Address x. Will not wait for SSCB to complete. Does check for command acceptance.
set_sscb_position	Board Address	Register							Uses the SSCB "A" command to reset the current motor position to what ever is in the temp register specified.(41-72 ONLY)
check_sscb_done	Board Address	Address if Ready	Address if Busy						Check to see if the SSCB board has completedits last command. If ready jump to ready address else jump to busy address (Address of 0=skip).
wait_sscb_done	Board Address								Wait for SSCB at Address x to complete last command.
wait_sscb_response	Board Address								Wait for a response from the SSMicro Board. This command is useful when the autocompletion command has been issued. ('f' status).
ssmicro	Board Address	Command							Send command to SSMicro at Address x. Will not wait for SSMicro to complete. Does check for command acceptance.
set_ssmicro_position	Board Address	Register							Uses the SSMicro "A" command to reset the current motor position to what ever is in the temp register specified.(41-72 ONLY)
check_ssmicro_done	Board Address	Address if Ready	Address if Busy						Check to see if the SSMicro board has completedits last command. If ready jump to ready address else jump to busy address (Address of 0=skip).
wait_ssmicro_done	Board Address								Wait for SSMicro at Address x to complete last command.
wait_ssmicro_response	Board Address								Wait for a response from the SSMicro Board. This command is useful when the autocompletion command has been issued. ('f' status).

12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

Simple Step LLC

Command Table (continued)

Command	Param1	Param2	Param3	Param4	Param5	Param6	Param7	Param8	Description
sscbhc	Board Address	Command							Send command to SSCBHC at Address x. Will not wait for SSCBHC to complete. Does check for command acceptance.
set_sscbhc_position	Board Address	Register							Uses the SSCBHC "A" command to reset the current motor position to what ever is in the temp register specified.(41-72 ONLY)
check_sscbhc_done	Board Address	Address if Ready	Address if Busy						Check to see if the SSCBHC board has completedits last command. If ready jump to ready address else jump to busy address (Address of 0=skip).
wait_sscbhc_done	Board Address								Wait for SSCBHC at Address x to complete last command.
wait_sscbhc_response	Board Address								Wait for a response from the SSCBHC Board. This command is useful when the autocompletion command has been issued. ('f' status).
ssxyz	Board Address	Command							Send command to SSXYZ at Address x. Will not wait for SSXYZ to complete. Does check for command acceptance.
set_ssxyz_position	Board Address	Motor	Register						Uses the SSXYZ "A" command to reset the current motor position to what ever is in the temp register specified.(41-72 ONLY)
check_ssxyz_done	Board Address	Motor	Address if Ready	Address if Busy					Check to see if the XYZ board has completedits last command. If ready jump to ready address else jump to busy address (Address of 0=skip).
wait_ssxyz_done	Board Address	Motor							Wait for SSXYZ at Address x for Motor x to complete last command.
wait_ssxyz_response	Board Address	Motor							Wait for a response from the SSXYZ Board. This command is useful when the autocompletion command has been issued. ('f' status).
ssqe	Board Address	Channel							Send a command to the SSQE at Address x.
link_me	Motor Brd. Address	Motor Type (X,Y,Z,S)	Encoder Brd. Address	Channel	Encoder Active/Not (0 or 1)	Retry Count (0-255)	Plus Tolerance (0-255)	Neg. Tolerance (0-255)	This command links the motor with the encoders. Once done when the user gives a motor movement command to the motor board the SSW in program will automatically check the asscoaiets encoder to see if the motor acutally moved there. If it has not and the motor position falls outside the Plus/Neg. Tolerance values, the SSW in program will try to correct.
sdelay	Time								Wait x time (in seconds) 1 - 65534
delay	Time								Wait x time (in milliseconds) 1 - 65534
input	Bit	Bit Set Value	Address						Reads Input port. If Bit value equals Bit Set Value go to user Address
output	Bit	Bit Set Value							Set Output port Bit to Bit Set Value.
loop	Address								Loop back to user Address
cloop	Count	Address							Loop back to user Address user times plus 1.
enable_comm_debug									Automatically enables the communications debugger, or if already active, reactivates the data logger.
disable_comm_debug									Disables the communications debugger data logger mode without shutting down the communications debugger window.
enable_qe_data_logger									Enables SSQE/SSXYQE data logging of all responses to a file named "qe.dat".
pause_qe_data_logger									Pauses SSQE/SSXYQE data logging without shutting the "qe.dat" file down.
disable_qe_data_logger									Disables SSQE/SSXYQE data logging and flushes all commands in the file buffer and closes the "qe.dat" file.
end_program									End Program.

12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

Simple Step LLC

SSWin Debugger

The SSWin program now has a debug mode built in. This debugger is simple, but allows the user to look at each command one command line at a time. The user can also tap into the communications and see what commands are being sent down to the Simple Step board and what the responses are. In addition we have now implemented a new status check into all command responses from any board on the network and if found, the SSWin program will stop execution and show you the error. The user can now either click on the run button, or active the debuger by clicking on the debug radio button. ***We must note however that if the user wants to terminate the SSWin program, the use must first deactivate the debug mode (if active) to get out of the program or even to run the program at full speed.***

The SSWin debugger will allow the user to single step through a program while watching registers change and/or communications back and forth from the network cards. To this end we have added a new communications debugger window. This new window shows the user in real time the commands sent down to the network (Host) and the responses from the boards being communicated with (Network). In addition, the Host sub-window gives information as an example "10/1 - D0M100". The first number in the string is the calling program line number, the secound number is the current Host window line number. The second number in the Host window allow the user to look at the Network window to determine if there is a corresponding line number. If found, this is the response from the Network at the time that command was sent. We have also added two (2) new SSWin commands. They are "enable_comm_debug" and "disable_comm_debug". This allows the user to enable and disable the communications debugger only at a certain point within the program. If the communications debugger is not active when the "enable_comm_debug" is activated, the SSWin program will initialize the window. After the "disable_comm_debug" is used, the SSWin program will not close the window but keep it open until the user stops the program and clicks on the "Comm. Debug" radio button to shut the window down.

The SSwin program now also has the ability to enable up to 6 breakpoints. Once a breakpoint is enabled by entering a program address, clicking on the update button and then clicking the run button, the system will hunt for all breakpoints entered by the user. Once found, the SSWin program will enable the debugger mode so that the user can single step from that point forward. The breakpoints can be disables by either clicking on the radio button to disable the window, or by putting a 0 in the appropriate breakpoint and clicking on the update button.

12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

Parameter Syntax

Parameter Syntax	Allowed Value Ranges
Address	1 - 1000 (0=Skip (Not all commands allow this))
Board Address	1 - 8
Command	String up to 50 characters surrounded by quotes.
Count	1 - 65535. Will count 1 + x times.
Bit	0 - 7 (Bit 0 to Bit 7)
Bit Set Value	0 (Low) or 1 (High)
Channel	0 or 1 (Channel 0 or Channel 1)
Register	1 to 56 (41-56 are copies of the encoders 1-16)
Motor	A= All three (X,Y, and Z), X, Y, or Z (S=SSCB)

Notes

- All values are unsigned integers unless otherwise noted.
- All commands sent to the SSCB will have a \r appended before being sent
- Spaces and Tabs between command and (;) comments are OK.
- Commands ARE case sensitive (must be lower case ONLY).
- Line numbers are used but cannot be used within file.
- Line numbers START at #1.
- Up to 1000 command strings can be used.
- Output port value is an unsigned character and a check of bits 0-7.
- Input port is a bit check 0-7.
- Output port DISPLAY is in HEX.
- Output/Input Base address for card must start with an “0x” and be followed by a hex address!!!!
- Escape key will ABORT ALL (including motors) and release the window if running a program!!!!!
- ‘S’top key is to stop the motors (ALL) and stop program AFTER last command is processed.
- ‘P’ause key will pause the system. sdelay and delay commands will be put on hold and will not finish.

12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

Configuration Dialog

The configuration dialog box can be found under the menu bar for File. The user must then click on the config menu command to bring up this window. This dialog box shows various configuration values that the user can set for the initialization process. The breakdown of this box is as follows:

- **Comm Port**
  This variable determines the PC's serial communications port. This is the port that the ***Simple Step*** Controller Board is connected to. Valid port ranges are from 1 to 4.

- **SSQE Output Port Setup**
  This variable determines the PC's serial communications port. This is the port that the ***Simple Step*** Controller Board is connected to. Valid port ranges are from 1 to 4.

- **Time-out**
  This variable determines the PC's serial communications port wait for response time-out. This variable is in milliseconds and values range from 1 to 65535.

- **Main Win**
  This variable determines the multi-tasking time-out in milliseconds to refresh the main window display.

- **Temp Win**
  This variable determines the multi-tasking time-out in milliseconds to refresh the Temporary Register window display.

- **Enc Win**
  This variable determines the multi-tasking time-out in milliseconds to refresh the Quadrature Encoder Register window display.

12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

Example #1

Boards used : 1-SSXYZ, and 1-SSQE

Description :

This example shows how the link_me command is used to perform auto-correc tion of the SSXYZ motor X with each movement using the feed back of the SSQE board.

```
001 - link_me,1,X,1,1,1,3,0,0 ;Link XYZ Board #1, motor X to SSQE Board #1,
                              ;Channel #1, Encoder Disabled, 3 retrys, 0 plus
                              ;tol., 0 minus tol.
002 - ssxyz,1,"XH"            ;Set XYZ Board #1, motor X to half step mode.
003 - ssxyz,1,"XS18"          ;Set XYZ Board #1, motor X with a Slope of 18.
004 - ssxyz,1,"XB13000"       ;Set XYZ Board #1, motor X with a Begin value of
                              ;13,000.
005 - ssxyz,1,"XE16450"       ;Set XYZ Board #1, motor X with a End value of
                              ;16,450.
006 - ssxyz,1,"XN+"           ;Home XYZ Board #1, motor X in the Clockwise Direc
                              ;tion.
007 - ssqe,1,"N+0"            ;Zero SSQE Board #1, Channel 0 to CW.
008 - ssqe,1,"N+1"            ;Zero SSQE Board #1, Channel 1 to CW.
009 - ssxyz,1,"XM5000"        ;Move XYZ Board #1, motor X to position 5,000.
010 - wait_ssxyz_done,1,X     ;Wait for XYZ Board #1, motor X to complete motor
                              ;movement.
011 - ssxyz,1,"XM0"           ;Move XYZ Board #1, motor X to position 0.
012 - wait_ssxyz_done,1,X     ;Wait for XYZ Board #1, motor X to complete motor
                              ;movement.
013 - loop,9                  ;Jump back to line 9.
014 - end_program             ;End of Programming.
```

Example #2

Boards used : 1-SSXYZ, and 1-SSQE

Description :

This example performs the same operation as Example #1 but instead of using the link_me command, the program actually performs the correction via the temp registers and the compare_temp commands.

```
001 - ssxyz,1,"XH"            ;Set XYZ Board #1, motor X to half step mode
002 - ssxyz,1,"XS18"          ;Set XYZ Board #1, motor X with a Slope of 18
003 - ssxyz,1,"XB13000"       ;Set XYZ Board #1, motor X with a Begin value of
                              ;13,000
004 - ssxyz,1,"XE16450"       ;Set XYZ Board #1, motor X with a End value of
                              ;16,450
005 - ssxyz,1,"XN+"           ;Home XYZ Board #1, motor X in the Clockwise Direc
                              ;tion
006 - ssqe,1,"N+1"            ;Zero SSQE Board #1, Channel 1 to CW
007 - ssxyz,1,"XM5000"        ;Move XYZ Board #1, motor X to position 5,000
008 - wait_ssxyz_done,1,X     ;Wait for XYZ Board #1, motor X to complete motor
                              ;movement
009 - ssqe,1,"p1"             ;Get SSQE Board #1, Channel 1 position
010 - compare_temp,42,5000,0,13,0 ;Compare Temp Register #42 (Encoder 2) to 5000,
                                  ;if less then goto line 11, if equal to go to
                                  ;line 13, if greater then go to line 11
011 - set_ssxyz_position,1,X,42 ;Set XYZ Board #1, motor X to what ever value is
                                ;in Temp Register #42 (Encoder 2). (This will be
```


12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

```
                              ;changed to Word format).
012 - cloop,4,7               ;loop back to address 7 4 times before going on to
                              ;line 13.
013 - ssxyz,1,"XM0"           ;Move XYZ Board #1, motor X to position 0.
014 - wait_ssxyz_done,1,X     ;Wait for XYZ Board #1, motor X to complete motor
                              ;movement.
015 - ssqe,1,"p1"             ;Get SSQE Board #1, Channel 1 position.
016 - compare_temp,42,0,0,19,0 ;Compare Temp Register #42 (Encoder 2) to 0, if
                              ;less then goto line 17, if equal to go to line 19,
                              ;if greater then go to line 17.
017 - set_ssxyz_position,1,X,42 ;Set XYZ Board #1, motor X to what ever value is
                              ;in Temp Register #42 (Encoder 2). (This will be
                              ;changed to Word format).
018 - cloop,4,13              ;loop back to address 13 4 times before going on to
                              ;line 19.
019 - loop,7                  ;Jump back to line 7.
020 - end_program             ;End of Programming.
```

Example #3

Boards used : 1-SSQE

Description :

This program allows the user to see the encoder reads displayed on the SSWin dialog screen while the motors move. (Both Channels 0 and 1).

```
001 - ssqe,1,"N+0"            ;Set SSQE Board #1, Channel 0 to zero and home in
                              ;the CW direction.
002 - ssqe,1,"N+1"            ;Set SSQE Board #1, Channel 1 to zero and home in
                              ;the CW direction.
003 - ssqe,1,"p0"             ;Read and display SSQE Board #1, Channel 0.
004 - ssqe,1,"p1"             ;Read and display SSQE Board #1, Channel 1.
005 - loop,3                  ;Jump back to Address #3.
006 - end_program             ;End of Programming.
```


12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

Index

12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343

U

W

12 West Owassa Turnpike, Newton, New Jersey, 07860 email:info@simplestep.com http://www.simplestep.com
Phone: (973) 948-2938 Fax (US Only): (888) 279-5708 Fax (Outside US): +01+253+981+9343