



SS-200x Selector Switch
Operating Manual

CPT-012-1410

Rev F

CrossPoint Technologies, Inc.
3 Foshay Rd.
Dudley, MA 01571
860-935-0284
CAGE: 3XJY8

Table Of Contents

1	Introduction	1
1.1	Applicability	1
1.2	Terminology	1
2	Controls and Indicators	2
2.1	Front Panel	2
2.2	Rear Panel	3
3	Installation	3
3.1	Connections	3
3.1.1	AC Power	3
3.1.2	Serial Port	3
3.2	RS-422 Remote Control Operation	4
4	Front Panel Operation	6
4.1	Remote and Local Modes	6
4.2	Setting Switches	6
4.3	Using the Menus	6
4.4	LCD screens and Menus	7
4.4.1	Menu Tree	7
4.4.2	Startup Splash	7
4.4.3	Connection Screen	8
5	Remote Control	12
5.1	Protocol	12
5.2	Command Set	13
5.2.1	Summary	13
5.2.2	Detailed Command and Status Formats	13
6	Ethernet Communication	16
	Appendix A	18
	SS-2000-1x8-IF	19
	SS-2001-1x8-XB	21
	SS-2000-32x1-LB-DO	23
	SS-2000-48x1-IF-DO	26
	SS-2000-4x1-KU-DO	29
	SS-2000-48x1-LB3-DO	31
	SS-2000-8x1-LB3	34
	SS-2001-8x1-XB	36
	SS-2001-4x1-KA-K-ENV	38
	SS-2001-32X1-MW-S	41
	SS-2001-8X1-MW-N	44

1 Introduction

CrossPoint Technologies Model SS-200x Selector Switches are available in a variety of input/output configurations. The operation and remote control interfaces are identical for all devices. The SS-2000 series are solid state switches. The SS-2001 use mechanical RF relays as their switching element. The chassis size varies with the complement of switches installed. Frequency range is customer specified.

1.1 Applicability

This manual covers a family of Selector Switches. The following models are included in this manual:

- SS-2000-1x8-IF
- SS-2000-4x1-KU-DO
- SS-2000-32x1-LB-DO
- SS-2000-48x1-IF-DO
- SS-2001-1x8-XB
- SS-2000-48X1-LB3-DO
- SS-2000-8X1-LB3
- SS-2001-8X1-XB
- SS-2001-4X1-KA-K-ENV
- SS-2001-32X1-MW-S
- SS-2001-8X1-MW-N

Detailed specifications and additional information for each model are found in the Appendix.

Note: The SS-2001-4X1-KA-ENV unit has no front panel keypad and can only be controlled via the RJ-45 Ethernet port. Refer to Section 6 of this manual for instructions to configure the Ethernet port.

Other models are available for different frequency ranges or for different numbers of channels. The SS-200x can be optimized to your application.

1.2 Terminology

Switches are specified in one of two ways. If the switch is designed as “one input to many outputs”, it is suited to *routing* applications. If it is designed as “many inputs to one output”, it will be used in a *selection* application. In some cases, the switches are actually bi-directional. But even if the switch is bi-directional, it is convenient in most applications to control them by thinking of them in one of these two ways.

For example, if a switch is specified as “8x1”, its front panel will allow the operator to select one of the 8 Inputs. But if the switch is defined as “1x6”, its front panel will allow the operator to choose one of the 6 Outputs.

Most CrossPoint SS-2000 switches have an “Off” setting, where there is no connection from input to output. A Failsafe switch will always have a connection path, even if power is not applied. The failsafe switch is only available in the SS-2001 series, where mechanical relays are used

2 Controls and Indicators

2.1 Front Panel

There are several different front panel heights, but the layout of the controls is always the same. The 1RU Switch Chassis front panel is shown here. All the indicators and controls are identified and explained below. More details on how to use these controls may be found in Section 4.

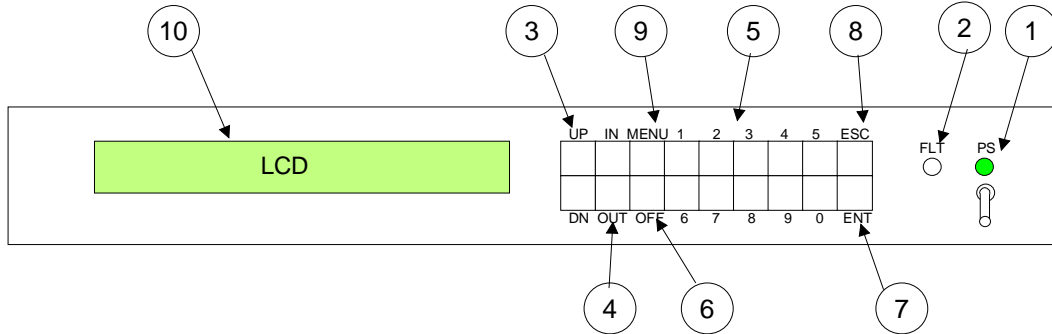


Figure 1 : Front Panel Controls and Indicators

Front Panel Controls and Indicators

Callout	Name	Description
1	POWER Indicator & Power switch	Illuminated green when power is on. Turns Red if a power supply problem is detected. Two LED's are present when there are redundant power supplies.
2	FAULT Indicator	Illuminated Red when any fault is detected in any chassis. This is a summary alarm indication
3	UP and DOWN	Used to cycle through the list of available inputs or outputs when in an Edit mode. Scrolls through Menu items when in MENU mode Incrementing/Decrementing rolls over/under at the extremes
4	IN and OUT	Press IN or OUT to enter the Edit mode, and change a switch connection.
5	Numeric keys	Enter switch port numbers directly using these keys.
6	OFF key	Used to disconnect an output. This key can be used in Edit mode. Press Enter to accept the OFF (disconnect) condition.
7	ENTER key	Accept the current input or output, exit the Edit mode and return to the next higher menu level.
8	ESCAPE key	Cancel the current Edit session and return to the next higher menu level. No changes occur to switch state.
9	MENU key	Move from the normal display to the various configuration and status menus.
10	LCD Display	For local status and control.

2.2 Rear Panel

Rear panels are customized to the different switch configurations. Specific drawings are found in the Appendix for each model that identify the connector reference numbers (“J numbers”).

3 Installation

The Switch Chassis mounts in a standard EIA rack.. There are no fans, convection cooling occurs from the top cover. Be careful not to block the vent holes. Normal clearances between this chassis and equipment in the rack space above assure adequate cooling. The unit does not require empty space above or below.

3.1 Connections

3.1.1 AC Power

The Switch is provided with a standard detachable US AC line cord. However, the internal power supplies have universal voltage capability (220/110 VAC). Plug the equipment into an AC source of either 110 or 220 VAC.

3.1.2 Serial Port

The serial port is a dual purpose connector located on the rear of the Switch. The connector is labeled CTRL. It provides RS-232 format signals as well as RS-422 signals. The chassis connector is a common 9 pin male D connector.

3.1.2.1 RS-232 Operation

RS-232 is recommended for cable lengths up to 50 feet between the computer and the switch. Longer links can be accommodated reliably, but may require experimenting with slower baud rates, lower loss cable and better shielding.

The link can operate at four baud rates between 2400 and 19200 bits per second. The baud rate is selected by the front panel menus. The other communication parameters are fixed at 8 bit words, no parity and 1 stop bit. Set your remote computer interface to the same settings. Factory default is 19200 baud.

The serial interface does not support hardware or software flow control. Commands and responses are relatively short and flow control is not normally required. The command/response method assures that the host computer can sense if the Switch is unable to accept more characters.

The RS-232 interface is pin compatible with standard PC serial ports, which use RS-574 pin assignments. To control the system from a PC, a “null Modem” cable is required. A Null Modem adapter can be used with a “straight through” cable, or a custom cable can be wired, following the diagram below.

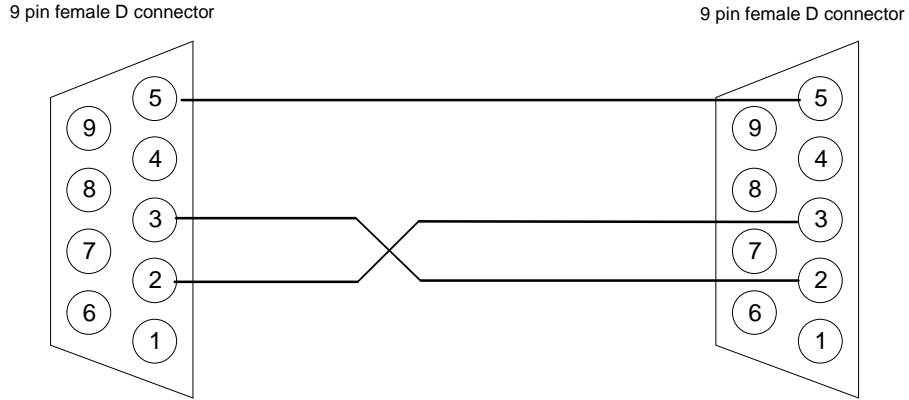


Figure 2 : PC to Switch Chassis – RS-232

The Serial port connector (CTRL) pin assignments are:

Pin	RS-232 Applicability	RS-485 Applicability	Circuit Function	Direction
1		X	TxDataB	Output
2	X		Receive Data	Input
3	X		Transmit Data	Output
4		X	RxDataB	Input
5	X	(Shield)	Gnd	
6		X	TxDataA	Output
7			unused	
8			unused	
9		X	RxDataA	Input

3.2 RS-422 Remote Control Operation

RS-422 operation allows data communication over cables of up to 4,000 feet. Use RS-422 when the remote computer must be located far from the switch chassis, or when ambient electronic noise levels are very high. The RS-422 standard uses balanced differential signaling, for significantly more reliable communication than RS-232. The drivers and receivers are RS-485 compliant, which makes them suitable for direct interface to full duplex RS-485 systems as well.

The link can operate at four baud rates between 2400 and 19200 bits per second. The other communication parameters are fixed at 8 bit words, no parity and 1 stop bit. Set your remote computer interface to the same settings. For long runs, a termination might be required to assure reliable communication at high baud rates. If you experience data integrity problems (parity errors, garbled data) try slower baud rates. If slower baud rates help, then try the faster rates with a 120 ohm terminating resistor across the receive data pins (RXA and RXB). Terminate each pair at its receiver. The terminations can be installed inside the back shells of the cable connectors. The actual resistance value may be adjusted to match the cable’s characteristic impedance. A value of 120 ohms is typical for twisted shielded pairs.

The serial interface does not support hardware or software flow control. Commands and responses are relatively short and flow control is not normally required. The command/response method assures that the host computer can sense if the Switch is unable to accept more characters.

The interface requires 2 twisted pairs of wires between the communicating devices. Shielding is recommended over the two pairs. For best performance and safety, do not ground the shield at both ends. Leave one end of the shield unconnected. If each pair is individually shielded, ground the shield at its source end (driven end) and leave it floating at its receiving end.

The suggested drawing below is for the RS-422 interface using 2 twisted shielded pairs. The computer side does not show pin numbers, as there are many forms of RS-422 connectors available. Notice the individual shields are grounded at opposite ends, and there is no ground continuity between the two devices (the two shields are assumed isolated from each other). In long runs, this serves to protect both devices from carrying ground currents, especially in the event of a power line fault in either device. If your cable has individual shields that are in intimate contact with each other, it may not be possible to avoid ground current flow down the cable shield.

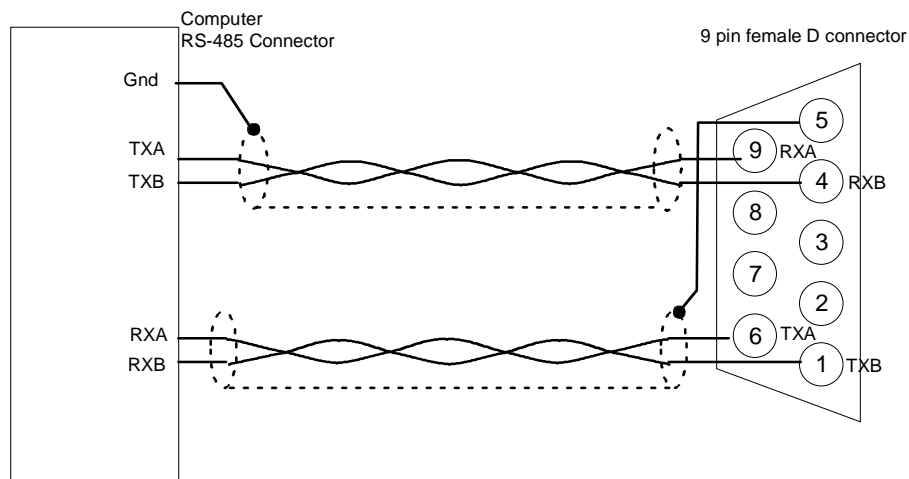


Figure 3 : Computer to Switch RS-422 Wiring

A standard PC RS-232 port can be transformed to balanced operation using an “RS-232 to RS-422” or “RS-232 to RS-485” adapter device. These devices are available from a variety of sources. Some can be powered directly from the RS-232 handshake signals available at the PC connector. This type is recommended, as it does not require a separate power supply or transformer for operation.

Suggested sources for these adapters are B&B Electronics (www.bb-elec.com or 815-433-5100) and Black Box Network Services (www.blackbox.com or 877-877-2269).

4 Front Panel Operation

After all external cable connections have been made, power up the Switch. The Switch will power on in Local mode, so the front panel is enabled. After displaying the model number, and initializing itself, the switch will set itself to the connection path that existed when it was powered down.

The following sections discuss general operations. Detailed operating sequences appear after the general discussion

4.1 Remote and Local Modes

Manual operation is permitted whenever the switch is in Local mode. The front panel can always be used to view the state of the switch. But to make changes, the switch must be placed into Local mode.

The remote computer can place the switch in Remote mode, thereby disabling changes from the front panel. However, the switch can be returned to Local mode using its front panel menus. The remote computer can also place the switch into Local Lockout state. In Local Lockout state, the front panel is disabled and cannot be used. The remote computer must release the switch from Local Lockout state before front panel control can occur. To allow recovery if the remote computer fails, the switch can be power cycled. It will always release the Local Lockout and revert to Local state at power up. The switch path may be interrupted during this power cycle operation, unless the switch is a failsafe type.

4.2 Setting Switches

To change the switch connection, press the IN or OUT key. For the SS-200x, these keys are interchangeable, regardless of whether the LCD display shows IN or OUT. Pressing IN/OUT will change the LCD display to an edit mode. A blinking cursor will appear to indicate the Switch is waiting for data. Use the numeric keys to specify the desired port, or use the UP and DOWN keys to increment/decrement through the available port numbers. Use the OFF key to break all RF connections. When the display shows the desired selection, press ENTER to confirm the choice. Pressing ESC will cancel the change.

As digits are entered, they scroll left, to the maximum number of digits allowed for the switch. If an incorrect digit is typed, follow it by correct digits, allowing the erroneous digit to “fall out” of the left of the display area. Leading zeroes may be entered to flush erroneous digits. The ENT key accepts only the digits actually displayed. An entry of “0” is the same as pressing the OFF key

When the ENT key is pressed, the Switch verifies that the number entered by the operator is within the valid range of the switch. If the operator enters a number that is out of range for the switch (e.g. typing in “9” for a 1x8 switch), the operation is aborted, and the LCD displays the previous selection. No change occurs in the RF path. If the number is accepted, the change is made to the RF path, and the display is updated. Any leading zeroes are removed and the cursor disappears

4.3 Using the Menus

The menu system provides screens for configuring certain internal parameters, such as serial interface baud rates. It also provides status information regarding internal fault monitoring. There are screens to restore the switch to its default settings. Menus are multi-level hierarchies. The operator chooses a level and moves to the next lower level until the specific items are reached

The normal display is the Connection screen, showing the state of the RF switch. Press the MENU key to change to the first menu heading. Use the UP/DOWN keys to scroll through the

headings. Press ENT to move down into the multi-level menus. Press ESC to return to the next higher menu level.

Once a specific parameter is reached, the parameter can be changed by using the UP/DN keys to see the various options. When the desired value is displayed, press ENT to make that the current value of the parameter. Press ESC to abort, and return to the next higher level.

Certain parameters require that the switch be reset. The reset operation occurs automatically, without powering off the switch. The LCD screen will display "Resetting" followed by the normal initialization screen. The RF connection will be restored, typically without actually being broken. The reset operation occurs whenever a communication parameter is changed (RS-232, RS-422 or Ethernet)

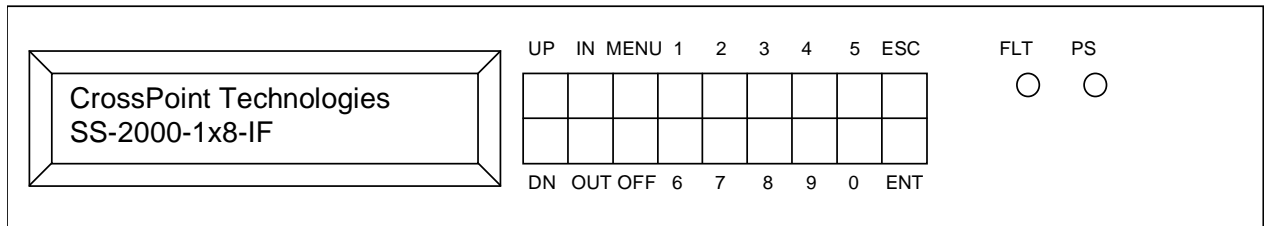
4.4 LCD screens and Menus

4.4.1 Menu Tree

- Startup Splash
- Connection Screen
 - Remote/Local Mode
 - BITE Status
 - Power Supply status
 - Maintenance & Setup
 - Serial Options
 - RS232/RS422 Interface Selection
 - Baud Rate
 - Software Version
 - Set Defaults

4.4.2 Startup Splash

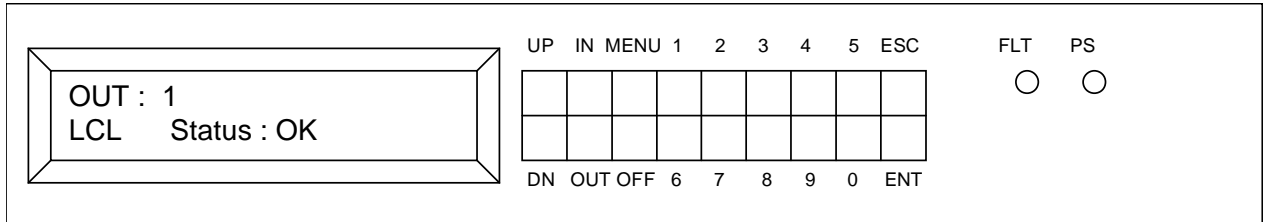
The splash screen is visible for 3 seconds after power on or reset. It gives the model number of the controller..



4.4.3 Connection Screen

Screen then goes to the Connection screen. This screen is visible whenever the user has not entered the Menu system. Connections can be changed from this screen if the Switch is in Local (LCL) mode. Connections are restored to the state they were in at power down.

This screen can be accessed by pressing the ESC key several times in any other menus. The system will back out of menus until it reaches this display.



The sequence of keystrokes to make a connection will differ for Fan In vs. Fan Out switches. Fan Out switches allow each output to be connected to only a single input at a time, while allowing any input to be connected to multiple outputs simultaneously. Conversely, a Fan In switch allows an input to be connected to a single output at a time, while an output can receive signals from many inputs simultaneously. The LCD display cannot easily show the multiple connections. Therefore, Fan Out switches are controlled by first specifying an output, and then selecting an input to route to that output. Fan In switches operate by first selecting an input and then selecting its single destination at an output.

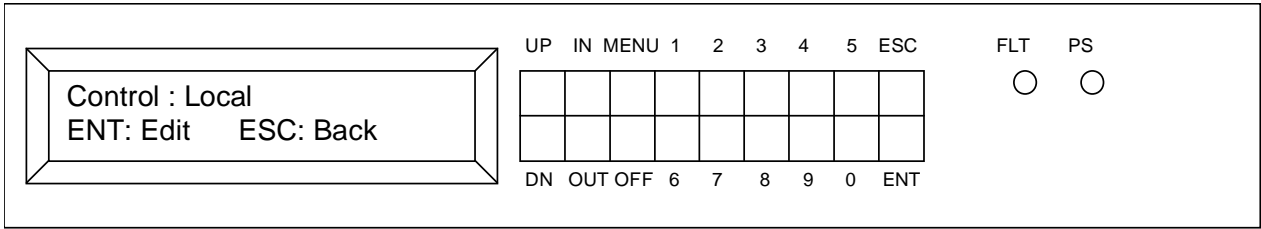
The display above is from the 1x8-IF. The Output is noted as “SEL OUT” to reinforce the idea that the Output is being changed when a new selection is entered. IF the SS-2000 has more than one internal switch, those switches can be selected using the IN field. The 1x8-IF has only a single switch, so the IN field is never changed.

Begin by pressing the OUT key. The channel number can be entered using the numeric keys or by the UP/DN keys to scroll. Press ENT when complete. Pressing OFF will turn the RF path off completely. Entering an Input value of 0 will also turn the output OFF. After ENT is pressed, the blinking cursor will disappear, indicating that the connection has been made. If a number is entered that is out of range, the screen will revert to the previous Input, and no change in connection will occur. Pressing ESC will exit the Edit mode without making any changes.

SS-2001 switches may have a failsafe switch installed. In this case, selecting OFF will actually result in an RF connection being made to the default switch selection (usually Output 1). It is not physically possible to turn a failsafe switch OFF. Failsafe switches provide an RF path even if AC power is not available. Selecting OFF will result in the message “Failsafe” appearing on the screen rather than OFF.

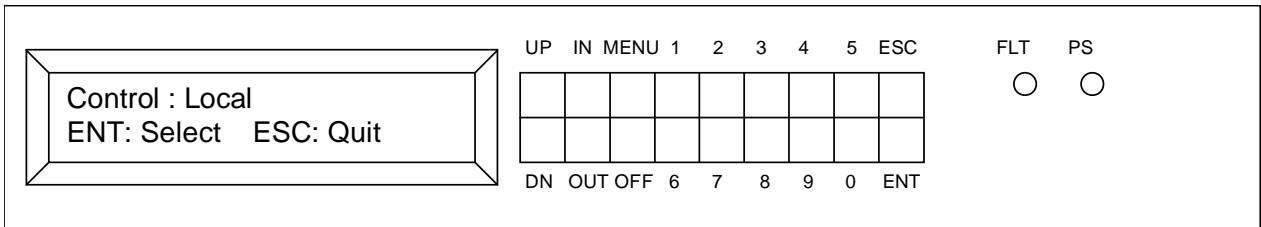
4.4.3.1 Remote/Local Control

From the connection screen, pressing MENU will bring up the first Menu heading. Scroll through the top level items using the UP/DN keys. Press ENT to step into a selection and view the current setting. Press ENT again to step into the list of choices. Choices are viewed by scrolling UP/DN. Press ENT to select a new parameter value. Press ESC to back up one level in the menu and abandon any changes. The first MENU screen will look like this:



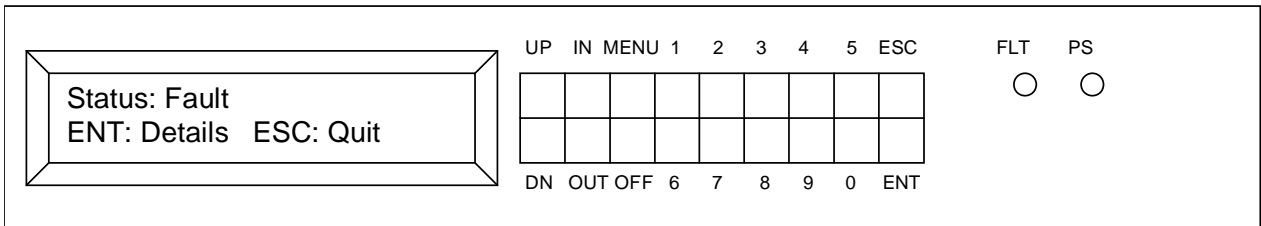
The Switch is in Local mode unless the remote computer has taken over the switch. If the screen shows "Remote", front panel control is disabled. (Switch settings can be viewed but not changed). When the system is in Remote mode, control can be acquired by pressing ENT to step into this menu item. Press UP or DN until the screen shows Local, as in the picture below. The bottom line instructs the operator to press ENT to confirm this change to Local mode. Pressing ESC will abandon the change, and back up one level to the top menu list.

The system may also be in Local Lockout mode. In this mode, the remote computer has absolute control. This menu item cannot be used to regain control from a Local Lockout condition. The remote computer must place the Switch into either Remote or Local modes or power must be cycled to release a Local Lockout.

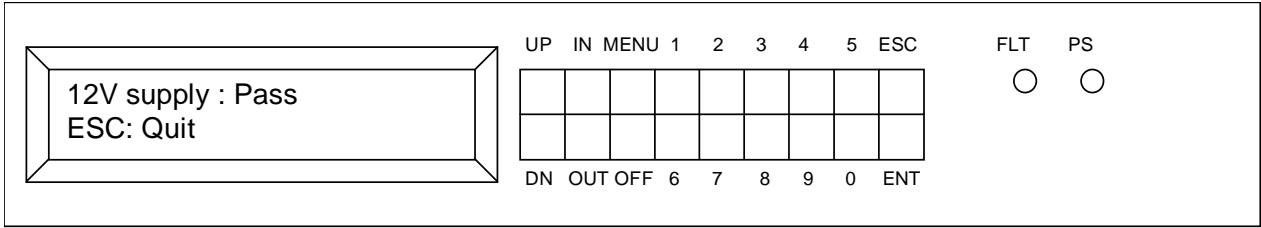


4.4.3.2 Status

The next top level Menu item, "Status", displays details from the built in test circuits. This example shows a Fault reported. The Red FLT lamp will be lit at all times when any fault is detected. If the problem is a power supply, the PS LED will be lit. Switches with redundant power supplies will have two LED's for this purpose. Press ENT to drop down and view details.

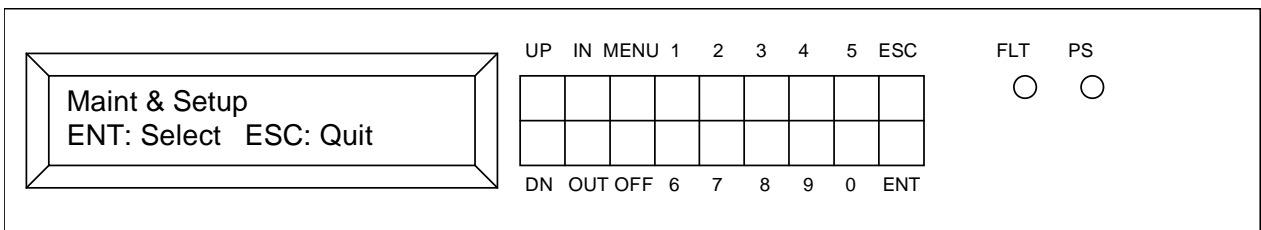


Use the UP/DN buttons to scroll through the various power supply voltages. A sample display is shown below:



4.4.3.3 Maintenance & Setup

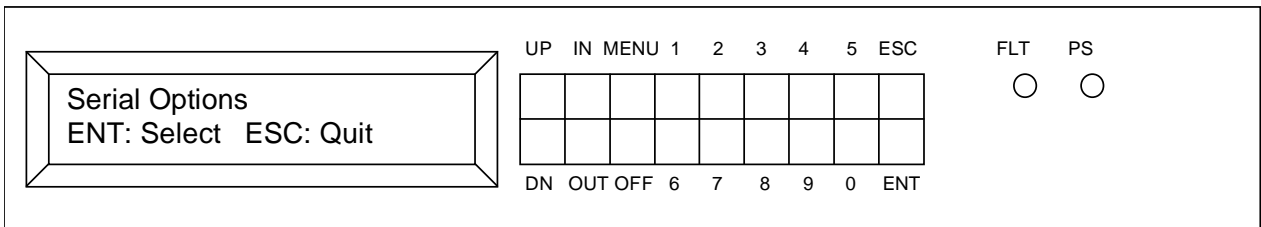
This top level menu item allows the setup of the serial port, and allows reading the software version identifier.



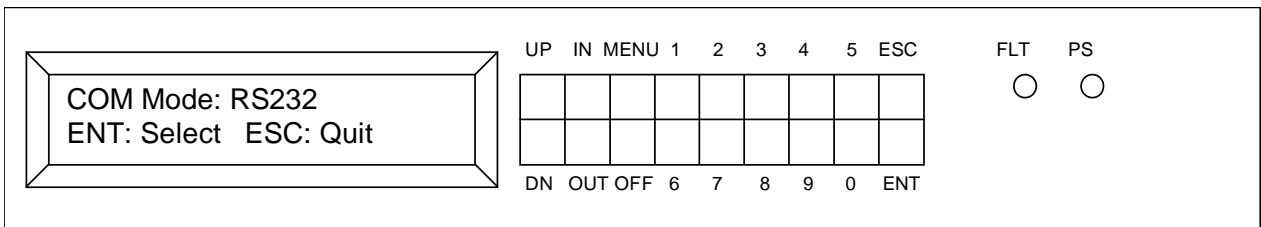
Press ENT to drop into the menu and scroll through the choices.

4.4.3.3.1 Serial Options

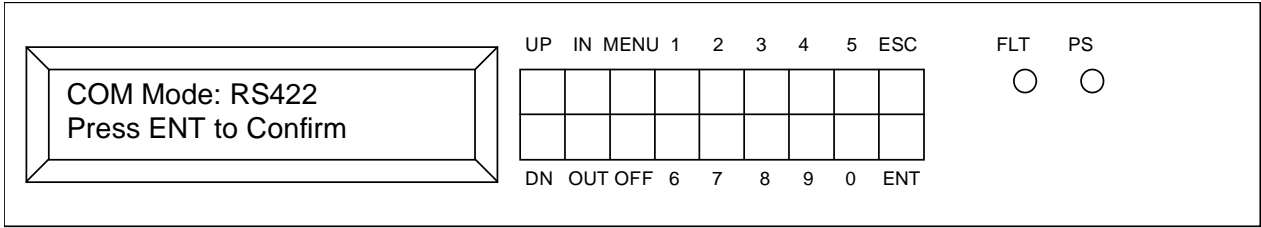
All serial communication settings are made from these menu items. Press ENT to drop into these items



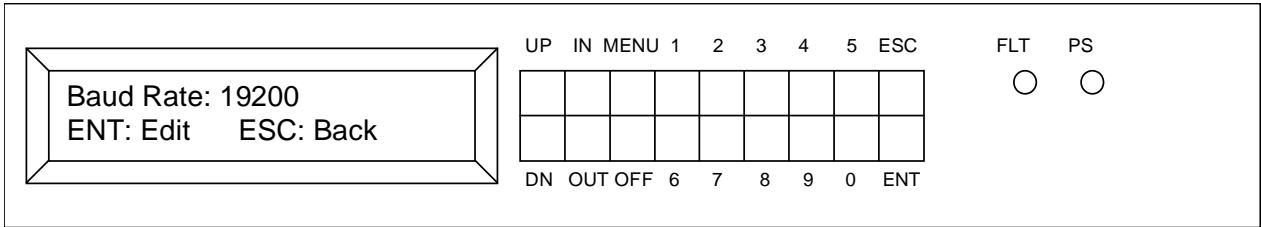
The default RS232 mode is shown here.



Pressing ENT will allow scrolling through the other choices. RS422 and (future) Ethernet are selected from this menu. To select RS422, use UP/DN until the screen shows RS422. Press ENT to change the interface. Changing Serial mode parameters will cause the Switch to reset itself automatically when the action is confirmed, and will be operational again in about 6 seconds.



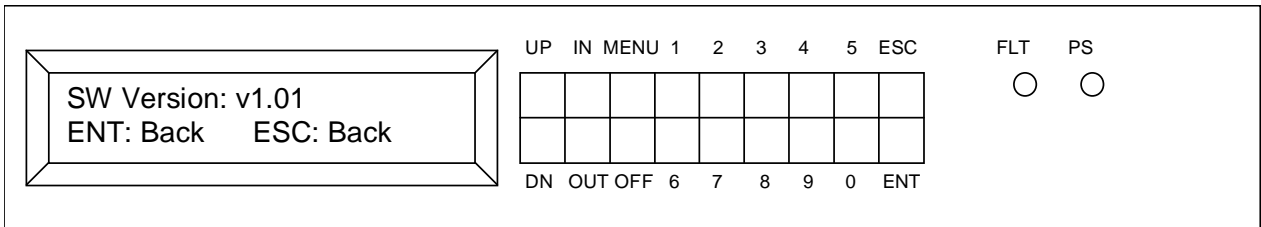
Similar menu choice selects baud rate. Factory default is 19200 baud.



Press ENT to drop into the menu item and scroll through available choices. Press ENT to change the baud rate. Changing Serial mode parameters will cause the Matrix to reset itself automatically when the action is confirmed, and will be operational again in about 6 seconds

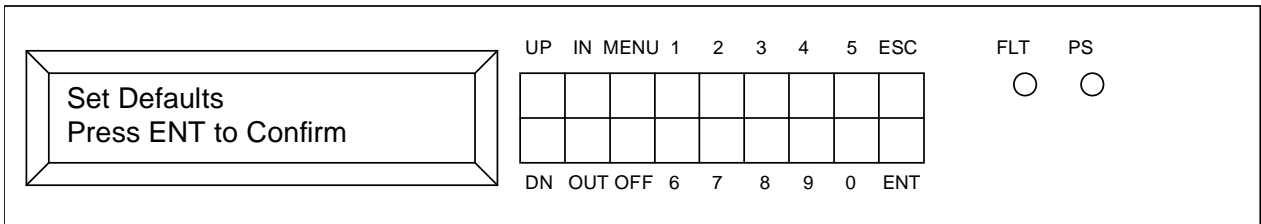
4.4.3.3.2 Software Version

This read only display shows the current installed version of firmware in the system controller.



4.4.3.4 Set Defaults

This menu item erases all communication parameters, and sets the switch to RS232, 19200 baud. All switches are set to their OFF condition (Failsafe models revert to failsafe condition). The Switch resets itself and will be operational again in about 6 seconds.



5 Remote Control

The switch system may be controlled from a dumb terminal or terminal emulator program, such as HyperTerm (found on most PC's). The switch system does not echo characters as they are typed. However, every command returns either a copy of what was received, or an error code. This reply returns after the command has executed, signaling that the command was acted upon.

5.1 Protocol

All messages and responses over the User IO interface are ASCII strings. No binary data is transmitted over this interface. Commands consist of 2 ASCII characters and may require an optional parameter string. Commands are terminated by carriage return (hex 0D). Execution does not begin until the carriage return is received.

Multiple commands may be sent on the same line if separated by a semicolon (;). Incoming command strings are limited to 63 characters, including the carriage return. Outgoing responses are truncated if they would exceed 255 characters.

In most cases, a command mnemonic can be followed by an ASCII question mark ("?"). This form of the command will be interpreted as a status request and the current value associated with that command will be returned. The state of the device will not be altered by a status request.

Parameters are typically separated by commas. Certain commands can have multiple parameter sets which are separated by parentheses.

The 2 character mnemonics are case insensitive on receipt, but will be upper case in the response.

Transmit and receive operations are synchronous to one another. Responses are returned when the command is complete. All commands are echoed after completion as a verification to the remote computer. If the host computer does not wait for the response string, it should allow 250 mSec between commands to ensure that it does not overrun internal buffers.

When input numbers or output numbers are required as parameters, they may omit leading zeroes. Up to 3 characters are accepted. The maximum switch size is 999 x 999.

When parameters are out of range (e.g. an input number is higher than the number of installed inputs), the command are not executed. In commands which include lists of items, all items are processed until an error is encountered. All items after an error are discarded, as well as the error itself. An error response is returned.

5.2 Command Set

5.2.1 Summary

Mnemonic	Description
AO	All Switches Open *
DS	Report All switch positions
ER	Error Response
ID	Identify Switch
RD	Restore Defaults
RL	Remote/Local state
SC	Switch Close
SO	Switch Open
SZ	Switch Size
TR	Test Report

* Not applicable in all units.

5.2.2 Detailed Command and Status Formats

AO All Switches Open

FORMAT: (1) AO

RESPONSE: (1) AO - if the switch is not Failsafe type
(2) FS - if the switch is a Failsafe type.

DESCRIPTION: Opens all switches in the SS-200x or sets them to their failsafe positions.

DS Dump Switch States

FORMAT: (1) DS
(2) DS?

RESPONSE: (1) same as format (2)
(2) DS(1,xxx)
The responses are organized by switch number and selection. Pairs are enclosed in parentheses. Commas separate the (M,N) pair. In the example above, switch 1 is selected as "xxx". A selection value of "0" signifies an output has no connection (and is not failsafe type)

DESCRIPTION: Dumps a list of all connections, listed by M . This is a status request only. No changes to switches will occur.

EXAMPLES: DS(1,003) : from a SS-2000-1x8-IF which has only a single switch. In this example, switch #1 is set to (output) selection 3.

DS(1,003)(2,004) : from a SS-2000-1x8x2-IF which has two independent 1x8 switches. In this example, switch number 1 is set to output selection 3 and switch number 2 is set to its output selection 4.

DS(1,005) : from a SS-2000-4x1-KU which has only a single switch. In this case, switch #1 is set to (input) selection 5.

ER Error Reply

DESCRIPTION: If the system detects an error in an incoming command, it will reply with ERxxx where the xxx is a numeric code indicating the error type. The offending command string may be appended after a colon.

EXAMPLE: sending a command "FG3" which is an unknown command will cause the system to reply with "ER001:FG". The list of possible error codes are:

Error Code	Description	Comments
ER001	Unrecognized command	
ER002	one or more parameters are incorrect	not used for numeric range errors
ER003	Command not applicable to this particular device	
ER004	one or more numeric parameters are out of range	
ER005	something wrong in how info is grouped (parens, semicolons, etc)	

ID Device ID

FORMAT: (1) ID
(2) ID?

RESPONSE: (1) same as (2)
(2) IDCrossPoint Technologies SS-2000-1X8-IF (example)

DESCRIPTION: Returns ASCII string identifying the Switch Matrix model. May be used as a confirmation that the device is communicating.

RL Remote or Local control

FORMAT: RL[R|L|K]
RL?

Where R = Remote mode
L = Local Mode
K = Remote with Local lockout mode

RESPONSE: RL[R|L|K]

DESCRIPTION: Determines whether the device uses the local keyboard or the Host port for commands. In Remote mode, the local front panel keys are disabled, though the user can regain Local control by suing the proper menu. In Local mode, the keys are enabled. While in Local mode, the Host port can assert control by issuing the RLR command. This will place the device in Remote mode, and disable the keyboard. (Most recent device to request control gets control) If the Host computer sends RLK, the front panel is locked out. The Host computer must issue the RLL or RLR command to remove the locked state.

EXAMPLE: RLL places the Switch Matrix in local mode, enabling the front panel.

DEFAULT: Powers up in Local mode, regardless of how it was configured at power down. This allows manual recovery from the lockout condition (RLK).

SC Switch Close

FORMAT: (1) SC(xxx,yyy)(zzz,aaa)..
(2) SCxxx?

Where xxx and zzz = input channel number in ASCII format
yyy and aaa = output channel number in ASCII format

Notice that the parameters pairs are in (input,output) order . Specifying an input or output connected to 0 is equivalent to issuing the SO command for that channel. The switch will be disconnected. SS-200x Switches with only need a single (in,out) pair in the SC command.

RESPONSE: (1) SC(xxx,yyy)(zzz,aaa)..
(2) SC(xxx,yyy) where yyy = the input attached to the designated output. A value of 0 indicates the output is unconnected (equivalent to SOxxx)

DESCRIPTION: This command connects a list of specified paths.

SO Switch Open

FORMAT: (1) SOxxx,yyy
Where xxx,yyy = comma separated list of output channel numbers in ASCII format

RESPONSE: (1) SOxxx,yyy
(2) FSxxx,yyy if failsafe type

DESCRIPTION: This command disconnects specified switches or places them in their failsafe position if applicable. Equivalent to SC(xxx,0) for N by 1 or SC(0,xxx) for 1 by N.

SZ Switch Size

FORMAT: (1) SZ
 (2) SZ?

RESPONSE: (1) same as (2)
 (2) SZxxx,yyy
 Where xxx = number of inputs and yyy = number of outputs.

DESCRIPTION: Returns the size of the switch.

TR Report Test Results

FORMAT: (1) TR
 (2) TR?

RESPONSE: (1) same as (2)
 (2) TR"string"
 where
 "string" is an ASCII string composed of internal values and parameters,
 and is dependent upon the configuration of the switch

DESCRIPTION: Returns test data (BITE) results. Return string will contain pass/fail indications for internal tests such as power supply voltages and switch cards.

EXAMPLE: Normal response might look like TR5V:P,BAT:P,12V:F. This response shows the 5V and Batteries both Pass internal monitoring, while the 12V supply failed. Redundant supplies will use an A or B designation to distinguish the status of the individual supplies. Most devices will return longer strings than this example.

6 Ethernet Communication

For Ethernet communication to the Switch the default is set to DHCP (Dynamic Host Configuration Protocol) so the network will provide an address unless you change the mode. Changes are retained in flash, and lost only if you load new system controller code - then defaults will be used.

To start a Telnet session, you will need to know the IP address of the switch. This can be discovered via serial port by sending "ES?"

Alternately, you can view the DHCP table from the Router. The Switch IP address is identified by the name CPTI_xxxxxx where the xxxxxx is the tail end of the hardware MAC address, unique for every system controller card.

If you want to set the Ethernet to a static IP, use the ES command in the format below. You will need to specify whether you want DHCP ON (network provides the address) or OFF (you provide a static address in the local network address range). For example, if you are using lynksys or netgear routers, they default to a 192.168.1.xxx range. Picking a value for xxx above 100 should keep you from conflicting with anything that might be on the network. Don't pick 127 or 255, since they are typically reserved for other purposes.

To set static IP you will need a mask (usually 255.255.255.0 unless you are on a larger network). Set the standard Telnet Port number to 23.

Command Format: ES,[DHCPON|DHCPOFF],staticIP,Mask,Port
Query Format: ES?

Example to set static IP
ES,DHCPOFF,192.168.1.150,255.255.255.0,23

Example to set DHCP on, so network provides the address (default)
ES,DHCPON,192.168.1.100,255.255.255.0,23
notice the IP values still appear, but they will not be used.

Response Format ES,[DHCPON|DHCPOFF],staticIP,Mask,Port
static IP
Response to ES? : ES,DHCPOFF192.168.001.050,255.255.255.000,23

DHCP response to ES? : ES,DHCPON192.168.001.003,255.255.255.000,23
in this case, the 192.168.001.003 is the address assigned by the network,so you can set the telnet (HyperTerminal) address

The ES command will also work from the Ethernet port, once you can find it the first time.

Whenever ES parameters are changed, the system will reset and the new settings take effect. It takes about 10 seconds for the initialization to finish. Serial and Ethernet commands will be ignored until that time.

If you are in a telnet session during the reset, you will need to disconnect, change the address if necessary, and reconnect. Even if you keep the same address, the Telnet session will probably fail until you disconnect and reconnect.

Appendix A

This sections provides details of
Specifications
Panel Drawings
Connectors
Spares Lists

These configurations are covered in this Appendix.

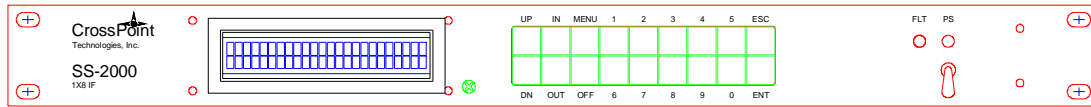
- SS-2000-1x8-IF
- SS-2001-1x8-XB
- SS-2000-32x1-LB-DO
- SS-2000-48x1-IF-DO
- SS-2000-4x1-KU-DO
- SS-2000-48X1-LB3-DO
- SS-2000-8X1-LB3
- SS-2001-8X1-XB
- SS-2001-4X1-KA-K-ENV
- SS-2001-32X1-MW-S
- SS-2001-8x1-MW-N

SS-2000-1x8-IF

Part Number : PL-CPT-012-1210

Specification	Conditions	Min	Typ	Max	Units
Frequency Range		20		200	MHz
Insertion Loss			-2	-4	dB
Isolation		60	65		dB
Impedance			50		Ω
VSWR				1.5	
Signal Level			-15		dBm
NF			2	4	dB
IP3 (input)			36		dBm
IP2 (input)			33		dBm
Temperature (Op)		0		50	$^{\circ}\text{C}$
AC Voltage		88		260	VAC
Power Consumption			6	8	W

Dimensions : 17 x 15 deep x 1.75 high (nominal) : 1 RU
 Switch Type : Solid state GaAsFET.
 Control : RS232 or RS422 selectable, and Front Panel Keypad.
 Connectors : SMA-F in and out



Front Panel



Rear Panel

Connector List

Ref	Connector Type	Name
J1	SMA-F	Input (Common) ¹
J2	SMA-F	Output 1 ¹
J3	SMA-F	Output 2 ¹
J4	SMA-F	Output 3 ¹
J5	SMA-F	Output 4 ¹
J6	SMA-F	Output 5 ¹
J7	SMA-F	Output 6 ¹
J8	SMA-F	Output 7 ¹
J9	SMA-F	Output 8 ¹
J10	D-9	Serial Control
J11	IEC	AC In
	Stud	Ground

¹ This product is bi-directional. Input and Output sense may be reversed for an 8x1 configuration.

Spares List (PL-CPT-012-1210)

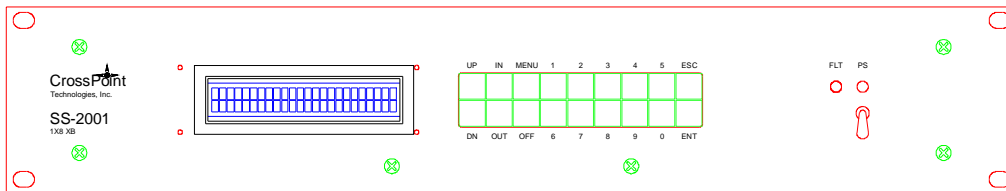
Ref	Qty per	Recommended Spares Qty	Part Number	Description
A1A1	1	-	CPT-012-1223	Rabbit Carrier Board , Programmed
A1A2	1	-	CPT-012-1220	Keyboard Assembly
A1A3	1	1	CPT-012-1212	8 Way Switch Assembly
A1A4	1	-	LCM-S02402DSF	LCD & Backlight Module
A1A5	1	1	GSM7-12	Power Supply 12V, .6A, 85- 264VAC
A1A6	1	1	SPN15-05S	Power Supply 5V, 3A, 85- 264VAC

SS-2001-1x8-XB

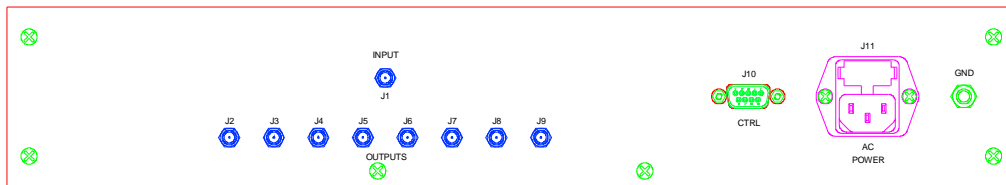
Part Number : PL-CPT-013-1210

Specification	Conditions	Min	Typ	Max	Units
Frequency Range		7.25		8.4	GHz
Insertion Loss			-1	-2.0	dB
Isolation		60			dB
Impedance			50		Ω
VSWR			1.2	1.5	
Signal Level				+23	dBm
Temperature (Op)		0		50	$^{\circ}\text{C}$
AC Voltage		88		260	VAC
Power Consumption			10	12	W

Dimensions : 17 x 15 deep x 3.5 high (nominal) : 2 RU
 Switch Type : Failsafe Coaxial Relay – output 1 selected if no power applied.
 Control : RS232 or RS422 selectable, and Front Panel Keypad.
 Connectors : SMA-F in and out



Front Panel



Rear Panel

Connector List

Ref	Connector Type	Name
J1	SMA-F	Input (Common) ¹
J2	SMA-F	Output 1 ¹
J3	SMA-F	Output 2 ¹
J4	SMA-F	Output 3 ¹
J5	SMA-F	Output 4 ¹
J6	SMA-F	Output 5 ¹
J7	SMA-F	Output 6 ¹
J8	SMA-F	Output 7 ¹
J9	SMA-F	Output 8 ¹
J10	D-9	Serial Control
J11	IEC	AC In
	Stud	Ground

¹ This product is bi-directional. Input and Output sense may be reversed for an 8x1 configuration.

Spares List (PL-CPT-013-1210)

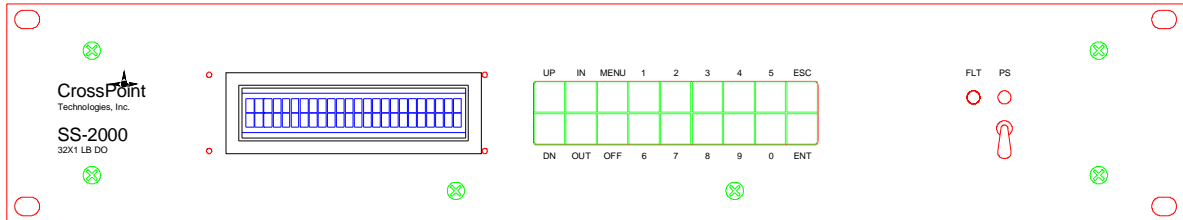
Ref	Qty per	Recommended Spares Qty	Part Number	Description
A1A1	1	-	CPT-013-1224	Rabbit Carrier Board , Programmed
A1A2	1	-	CPT-012-1220	Keyboard Assembly
A1A3	1	1	CPT-010-1224	Relay Driver Assembly
A1A4	1	-	LCM-S02402DSF	LCD & Backlight Module
A1A5	1	1	SPN15-24S	Power Supply, 24V
A1A6	1	1	SPN15-05S	Power Supply, 5V
A1A7	1	1	8HS2A34LA	Switch, Coaxial Relay, SP8T

SS-2000-32x1-LB-DO

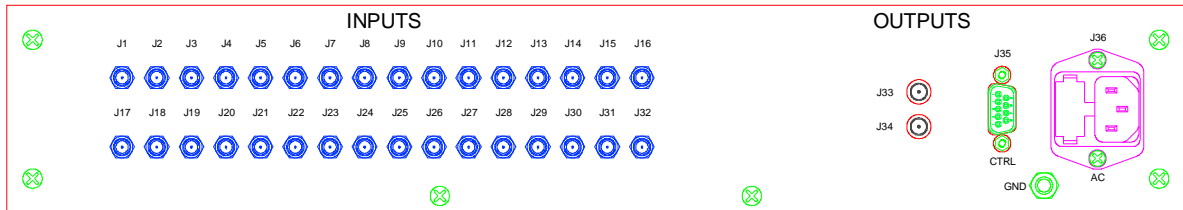
Part Number : PL-CPT-014-1210

Specification	Conditions	Min	Typ	Max	Units
Frequency Range		950		1750	MHz
Insertion Loss		-6	-8	-9	dB
Isolation		65	75		dB
Impedance			50		Ω
VSWR				1.5	
Signal Level			-15		dBm
NF				14	dB
IP3 (input)			19		dBm
Temperature (Op)		0		50	$^{\circ}\text{C}$
AC Voltage		88		260	VAC
Power Consumption				12	W

Dimensions : 17 x 15 deep x 3.5 high (nominal) : 2 RU
 Switch Type : Solid state GaAsFET.
 Control : RS232 or RS422 selectable, and Front Panel Keypad.
 Connectors : SMA-F in and out



Front Panel



Rear Panel

Connector List

Ref	Connector Type	Name
J1	SMA-F	Input 1
J2	SMA-F	Input 2
J3	SMA-F	Input 3
J4	SMA-F	Input 4
J5	SMA-F	Input 5
J6	SMA-F	Input 6
J7	SMA-F	Input 7
J8	SMA-F	Input 8
J9	SMA-F	Input 9
J10	SMA-F	Input 10
J11	SMA-F	Input 11
J12	SMA-F	Input 12
J13	SMA-F	Input 13
J14	SMA-F	Input 14
J15	SMA-F	Input 15
J16	SMA-F	Input 16
J17	SMA-F	Input 17
J18	SMA-F	Input 18
J19	SMA-F	Input 19
J20	SMA-F	Input 20
J21	SMA-F	Input 21
J22	SMA-F	Input 22
J23	SMA-F	Input 23
J24	SMA-F	Input 24
J25	SMA-F	Input 25
J26	SMA-F	Input 26
J27	SMA-F	Input 27
J28	SMA-F	Input 28
J29	SMA-F	Input 29
J30	SMA-F	Input 30
J31	SMA-F	Input 31
J32	SMA-F	Input 32
J33	SMA-F	Output
J34	SMA-F	Output
J35	D-9	Serial Control
J36	IEC	AC In
	Stud	Ground

Spares List (PL-CPT-014-1210)

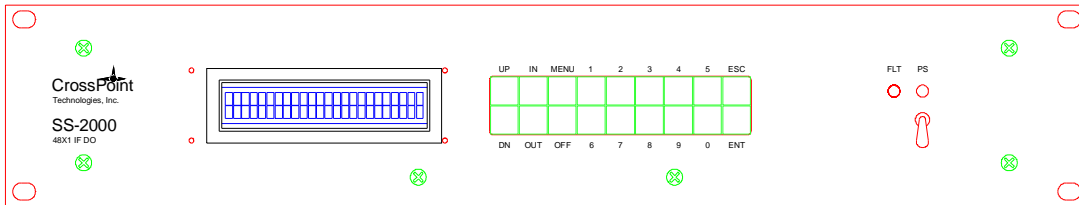
Ref	Qty per	Recommended Spares Qty	Part Number	Description
A1A1	1	-	CPT-014-1225	Rabbit Carrier Board , Programmed
A1A2	1	-	CPT-012-1220	Keyboard Assembly
A1A3	1	-	LCM-S02402DSF	LCD & Backlight Module
A1A4, A1A5	2	1	CPT-014-1224	16 way GaAs Switch Card, L Band
A1A6	1	1	SPN15-05S	Power Supply 5V, 3A 85-264 VAC
A1A7	1	1	GSM7-12	Power Supply 12V, .6A 85- 264VAC
A1A8	1	1	GSM7-5	Power Supply 5V, 1.4A 85- 264VAC
A1A9, A1A10	2	-	PD-2007-S	Power Divider, 2-way

SS-2000-48x1-IF-DO

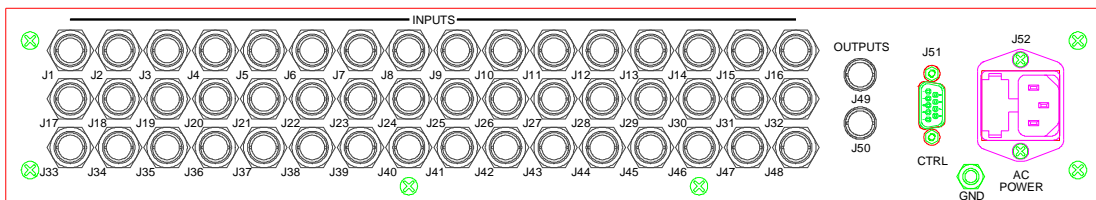
Part Number : PL-CPT-015-1210

Specification	Conditions	Min	Typ	Max	Units
Frequency Range		20		200	MHz
Insertion Loss			-7	-8	dB
Isolation			65		dB
Impedance			50		Ω
VSWR				1.5	
Signal Level			-15		dBm
NF				13	dB
IP3 (input)			18		dBm
IP2 (input)			26		dBm
Temperature (Op)		0		50	$^{\circ}\text{C}$
AC Voltage		88		260	VAC
Power Consumption				20	W

Dimensions : 17 x 15 deep x 3.5 high (nominal) : 2 RU
 Switch Type : Solid state GaAsFET.
 Control : RS232 or RS422 selectable, and Front Panel Keypad.
 Connectors : BNC-F in and out



Front Panel



Rear Panel

Connector List

Ref	Connector Type	Name
J1	BNC -F	Input 1
J2	BNC -F	Input 2
J3	BNC-F	Input 3
J4	BNC-F	Input 4
J5	BNC-F	Input 5
J6	BNC-F	Input 6
J7	BNC-F	Input 7
J8	BNC-F	Input 8
J9	BNC-F	Input 9
J10	BNC-F	Input 10
J11	BNC-F	Input 11
J12	BNC-F	Input 12
J13	BNC-F	Input 13
J14	BNC-F	Input 14
J15	BNC-F	Input 15
J16	BNC-F	Input 16
J17	BNC-F	Input 17
J18	BNC-F	Input 18
J19	BNC-F	Input 19
J20	BNC-F	Input 20
J21	BNC-F	Input 21
J22	BNC-F	Input 22
J23	BNC-F	Input 23
J24	BNC-F	Input 24
J25	BNC-F	Input 25
J26	BNC-F	Input 26
J27	BNC-F	Input 27
J28	BNC-F	Input 28
J29	BNC-F	Input 29
J30	BNC-F	Input 30
J31	BNC-F	Input 31
J32	BNC-F	Input 32
J33	BNC-F	Input 33
J34	BNC-F	Input 34
J35	BNC-F	Input 35
J36	BNC-F	Input 36
J37	BNC-F	Input 37
J38	BNC-F	Input 38
J39	BNC-F	Input 39
J40	BNC-F	Input 40
J41	BNC-F	Input 41
J42	BNC-F	Input 42
J43	BNC-F	Input 43
J44	BNC-F	Input 44
J45	BNC-F	Input 45
J46	BNC-F	Input 46
J47	BNC-F	Input 47
J48	BNC-F	Input 48
J49	BNC-F	Output
J50	BNC-F	Output
J51	D-9	Serial Control
J52	IEC	AC In
	Stud	Ground

Spares List (PL-CPT-015-1210)

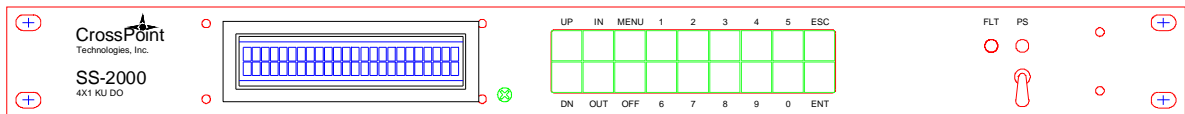
Ref	Qty per	Recommended Spares Qty	Part Number	Description
A1A1	1	-	CPT-015-1230	Rabbit Carrier Board , Programmed
A1A2	1	-	CPT-012-1220	Keyboard Assembly
A1A3	1	-	LCM-S02402DSF	LCD & Backlight Module
A1A4 – A1A6	3	1	CPT-015-1222	16 way GaAs Switch Card, IF
A1A7	1	1	SPN15-05S	Power Supply, 5V, 3A, 85- 264VAC
A1A8	1	1	GSM7-12	Power Supply, 12V, .6A, 85- 264VAC
A1A9	1	1	GSM7-5	Power Supply, 5V, 1.4A 85- 264VAC
A1A10	1	-	PD-3003-S	Power Divider, 3-way, IF
A1A11	1	-	PD-2-VHF-B-50	Power Divider, 2-way, IF

SS-2000-4x1-KU-DO

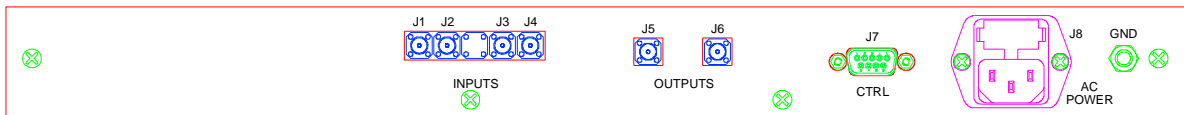
Part Number : PL-CPT-016-1210

Specification	Conditions	Min	Typ	Max	Units
Frequency Range		10.25		14.5	GHz
Insertion Loss			-9		dB
Isolation		60			dB
Impedance			50		Ω
VSWR				1.5	
Signal Level			-15		dBm
IP3 (input)			18		dBm
Temperature (Op)		0		50	$^{\circ}\text{C}$
AC Voltage		88		260	VAC
Power Consumption			6	8	W

Dimensions : 17 x 15 deep x 1.75 high (nominal) : 1 RU
 Switch Type : Solid State PIN diodes
 Control : RS232 or RS422 selectable, , and Front Panel Keypad.
 Connectors : SMA-F in and out



Front Panel



Rear Panel

Connector List

Ref	Connector Type	Name
J1	SMA-F	Input 1 ¹
J2	SMA-F	Input 2 ¹
J3	SMA-F	Input 3 ¹
J4	SMA-F	Input 4 ¹
J5	SMA-F	Output ¹
J6	SMA-F	Output ¹
J7	D-9	Serial Control
J8	IEC	AC In
	Stud	Ground

¹ This product is bi-directional. Input and Output sense may be reversed for an 4x1 (dual in) configuration. The power divider will sum the two inputs before switching.

Spares List (PL-CPT-016-1210)

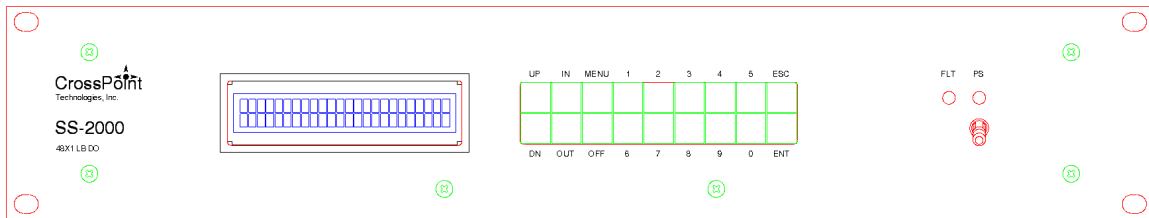
Ref	Qty per	Recommended Spares Qty	Part Number	Description
A1A1	1	-	CPT-016-1224	Rabbit Carrier Board , Programmed
A1A2	1	-	CPT-012-1220	Keyboard Assembly
A1A3	1	1	SP4T-4013R-A	Switch, SP4T, Reflective, Ku Band
A1A4	1	-	LCM-S02402DSF	LCD & Backlight Module
A1A5	1	1	GSM7-12	Power Supply, 15V
A1A6	1	1	SPN15-05S	Power Supply, 5V
A1A7	1	-	P216K-1	Power Divider, 2-way, Ku Band

SS-2000-48x1-LB3-DO

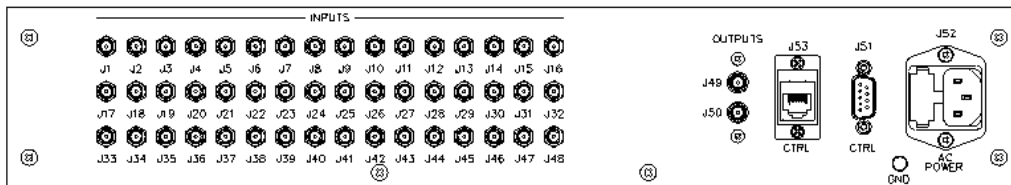
Part Number: PL-CPT-031-1210

Specification	Conditions	Min.	Typ.	Max.	Units
Frequency Range		950		2150	MHz
Insertion Loss		-12	-10	-8	dB
Isolation			55		dB
Impedance			50		Ω
VSWR				1.5:1	
Signal Level			-15		dBm
NF			17		dB
Temperature (Op)		0		50	$^{\circ}\text{C}$
AC Voltage		88		260	VAC

Dimensions: 17 x 15 deep x 3.5 high (nominal): 2 RU
 Switch Type: Solid state GaAsFET
 Control: R232 or RS422 selectable, Ethernet, and Front Panel Keypad.
 Connectors: SMA-F in and out



Front Panel



Rear Panel

Connector List:

Ref	Connector Type	Name
J1	SMA -F	Input 1
J2	SMA -F	Input 2
J3	SMA -F	Input 3
J4	SMA -F	Input 4
J5	SMA -F	Input 5
J6	SMA -F	Input 6
J7	SMA -F	Input 7
J8	SMA -F	Input 8
J9	SMA -F	Input 9
J10	SMA -F	Input 10
J11	SMA -F	Input 11
J12	SMA -F	Input 12
J13	SMA -F	Input 13
J14	SMA -F	Input 14
J15	SMA -F	Input 15
J16	SMA -F	Input 16
J17	SMA -F	Input 17
J18	SMA -F	Input 18
J19	SMA -F	Input 19
J20	SMA -F	Input 20
J21	SMA -F	Input 21
J22	SMA -F	Input 22
J23	SMA -F	Input 23
J24	SMA -F	Input 24
J25	SMA -F	Input 25
J26	SMA -F	Input 26
J27	SMA -F	Input 27
J28	SMA -F	Input 28
J29	SMA -F	Input 29
J30	SMA -F	Input 30
J31	SMA -F	Input 31
J32	SMA -F	Input 32
J33	SMA -F	Input 33
J34	SMA -F	Input 34
J35	SMA -F	Input 35
J36	SMA -F	Input 36
J37	SMA -F	Input 37
J38	SMA -F	Input 38
J39	SMA -F	Input 39
J40	SMA -F	Input 40
J41	SMA -F	Input 41
J42	SMA -F	Input 42
J43	SMA -F	Input 43
J44	SMA -F	Input 44
J45	SMA -F	Input 45
J46	SMA -F	Input 46
J47	SMA -F	Input 47
J48	SMA -F	Input 48
J49	SMA -F	Output
J50	SMA -F	Output
J51	D-9	Serial Control
J52	IEC	AC In
J53	RJ-45	Ethernet Control
GND	Stud	Ground

Spares List (PL-CPT-031-1210)

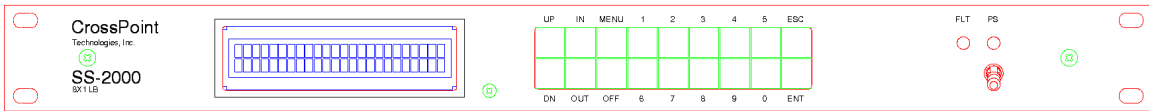
Ref	Qty per	Recommended Spares Qty	Part Number	Description
A1A1	1	-	CPT-031-1230	Rabbit Carrier Board , Programmed
A1A2	1	-	CPT-031-1220	Keyboard Assembly
A1A3	1	-	LCM-S02402DSF	LCD & Backlight Module
A1A4 – A1A6	3	1	CPT-014-1224	16 way GaAs Switch Card
A1A7	1	1	SPN15-05S	Power Supply, 5V, 3A, 85- 264VAC
A1A8	1	1	ECL10US12-T	Power Supply, 12V, .83A, 85- 264VAC
A1A9	1	1	GSM7-5	Power Supply, 5V, 1.4A 85- 264VAC
A1A10	1	-	PD-4-LB3-S	Power Divider, 4-way
A1A11	1	-	PD-2-LB3-S	Power Divider, 2-way

SS-2000-8x1-LB3

Part Number: PL-CPT-030-1210

Specification	Conditions	Min.	Typ.	Max.	Units
Frequency Range		950		2150	MHz
Insertion Loss		-2	0	+2	dB
Isolation			55		dB
Impedance			50		Ω
VSWR				1.5:1	
Signal Level			-15		dBm
NF			17		dB
Temperature (Op)		0		50	$^{\circ}\text{C}$
AC Voltage		88		260	VAC

Dimensions: 17 x 15 deep x 1.75 high (nominal): 1 RU
 Switch Type: Solid state GaAsFET
 Control: R232 or RS422 selectable, Ethernet, and Front Panel Keypad.
 Connectors: SMA-F in and out



Front Panel



Rear Panel

Connector List:

Ref	Connector Type	Name
J1	SMA -F	Input 1
J2	SMA -F	Input 2
J3	SMA -F	Input 3
J4	SMA -F	Input 4
J5	SMA -F	Input 5
J6	SMA -F	Input 6
J7	SMA -F	Input 7
J8	SMA -F	Input 8
J9	SMA -F	Output
J10	D-9	Serial Control
J11	IEC	AC In
J12	RJ-45	Ethernet Control
GND	Stud	Ground

Spares List (PL-CPT-030-1210)

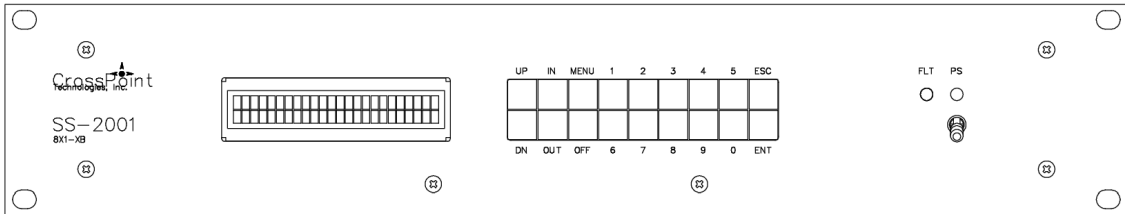
Ref	Qty per	Recommended Spares Qty	Part Number	Description
A1A1	1	-	CPT-030-1230	Rabbit Carrier Board , Programmed
A1A2	1	-	CPT-012-1220	Keyboard Assembly
A1A3	1	-	LCM-S02402DSF	LCD & Backlight Module
A1A4 – A1A6	3	1	CPT-007-1224	16 way GaAs Switch Card
A1A7	2	2	CU20-10	Power Supply, 5V, 4.4A, 85- 264VAC
A1A8	1	1	CU20-12	Power Supply, 12V, 1.8A, 85- 264VAC

SS-2001-8x1-XB

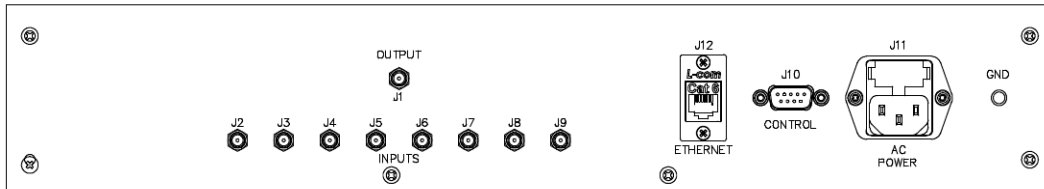
Part Number : PL-CPT-033-1210

Specification	Conditions	Min	Typ	Max	Units
Frequency Range		7.25		8.4	GHz
Insertion Loss			-1	-2.0	dB
Isolation		60			dB
Impedance			50		Ω
VSWR			1.2	1.5	
Signal Level				+23	dBm
Temperature (Op)		0		50	$^{\circ}$ C
AC Voltage		88		260	VAC
Power Consumption			7	10	W

Dimensions : 17 x 15 deep x 3.5 high (nominal) : 2 RU
 Switch Type : Failsafe Coaxial Relay – output 1 selected if no power applied.
 Control : RS232 or RS422 selectable, Ethernet, and Front Panel Keypad
 Connectors : SMA-F in and out



Front Panel



Rear Panel

Connector List

Ref	Connector Type	Name
J1	SMA-F	Input (Common) ¹
J2	SMA-F	Output 1 ¹
J3	SMA-F	Output 2 ¹
J4	SMA-F	Output 3 ¹
J5	SMA-F	Output 4 ¹
J6	SMA-F	Output 5 ¹
J7	SMA-F	Output 6 ¹
J8	SMA-F	Output 7 ¹
J9	SMA-F	Output 8 ¹
J10	D-9	Serial Control
J11	IEC	AC In
J12	RJ-45	Ethernet Control
	Stud	Ground

¹ This product is bi-directional. Input and Output sense may be reversed for an 8x1 configuration.

Spares List (PL-CPT-033-1210)

Ref	Qty per	Recommended Spares Qty	Part Number	Description
A1A1	1	-	CPT-033-1224	Rabbit Carrier Board , Programmed
A1A2	1	-	CPT-012-1220	Keyboard Assembly
A1A3	1	1	CPT-018-1222	Relay Driver Assembly
A1A4	1	-	LCM-S02402DSF	LCD & Backlight Module
A1A5	1	1	ECM60US24	Power Supply, 24V
A1A6	1	1	ECL10US05-T	Power Supply, 5V
A1A7	1	1	8HS2A34LA	Switch, Coaxial Relay, SP8T

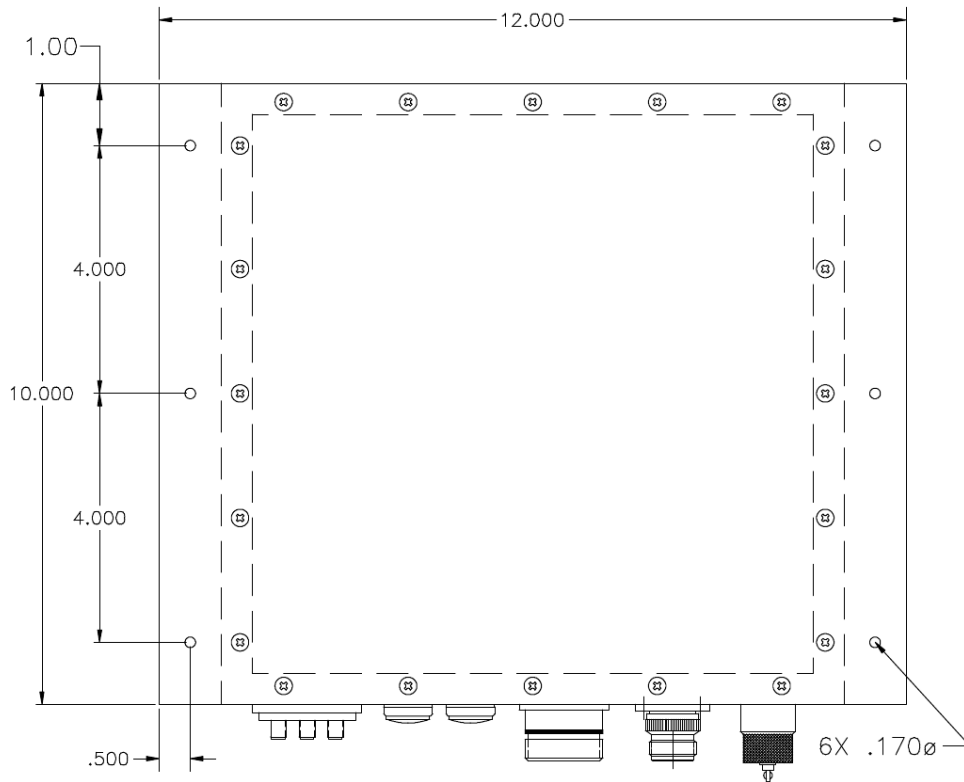
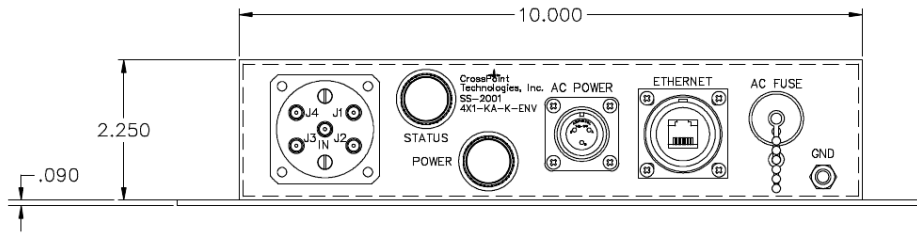
SS-2001-4x1-KA-K-ENV

Part Number: PL-CPT-136-1210

Specification	Conditions	Min	Max	Units
Frequency Range		DC	40.0	GHz
Insertion Loss	DC – 6 GHz		0.2	dB
	6 – 12 GHz		0.4	dB
	12 – 18 GHz		0.5	dB
	18 – 26.5 GHz		0.7	dB
	26.5 – 40 GHz		1.0	dB
Isolation	DC – 6 GHz	70		dB
	6 – 12 GHz	60		dB
	12 – 18 GHz	60		dB
	18 – 26.5 GHz	55		dB
	26.5 – 40 GHz	50		dB
VSWR (50Ω Reference)	DC – 6 GHz		1.3:1	
	6 – 12 GHz		1.4:1	
	12 – 18 GHz		1.5:1	
	18 – 26.5 GHz		1.7:1	
	26.5 – 40 GHz		2.0:1	
Temperature (Op)		0	50	°C
AC Voltage	47 – 63 Hz	90	264	VAC
Power Consumption			5	W

Dimensions : 10" x 10" deep x 2.25" high (nominal)
 Switch Type : Coaxial Relay – Normally Open
 Control : Ethernet
 RF Connectors: K Type - Female In and Out

NOTE: All RF Input and Output Connectors are "K" type Female. Using mating connectors other than "K" type could cause damage and greatly affect the RF performance of the unit.



SS-2001-4X1-KA-K-ENV Unit

Connector List

Ref	Connector Type	Name
J1	K Type -F	Input 1 ¹
J2	K Type -F	Input 2 ¹
J3	K Type -F	Input 3 ¹
J4	K Type -F	Input 4 ¹
IN	K Type -F	Output 1 (Common) ¹
AC POWER	97-3100A-14S-1P	AC Power Input 90 – 264 VAC, 47-63 Hz
ETHERNET	RJFTV-2PEM-1-G	RJ-45 Ethernet Control
GND	Stud	Ground

¹ This product is bi-directional. Input and Output ports may be reversed for a 1x4 configuration.

Rear Panel Indicators / Fuses

Ref	Part Number	Name
AC FUSE	340313 ¹	Fuse Holder 20A 3AG RF Shielded/Watertight
STATUS	557-1412-203F	Blinking Green LED (Indicates CPU Functioning)
POWER	557-1412-203F	Green LED (DC Power Indicator)

¹ AC Fuse Part Number: 0312002.HXP

Replaceable Parts

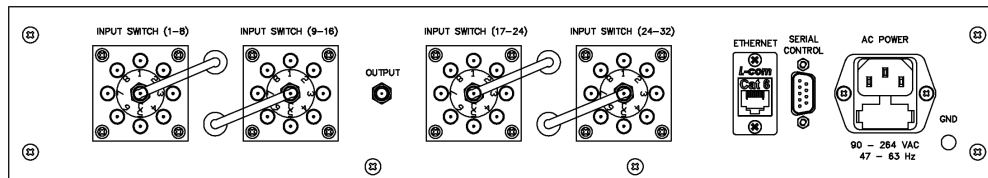
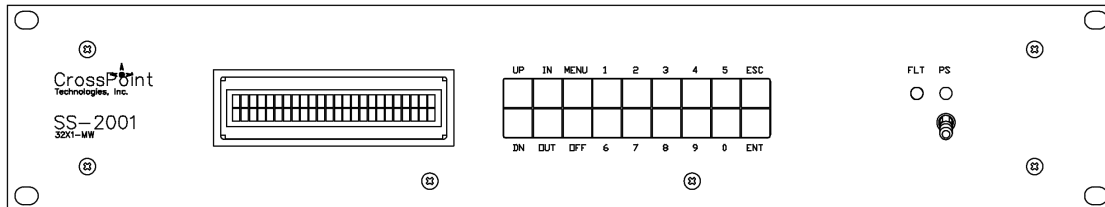
Qty Used per	Part Number	Description
1	CPT-136-1230	Rabbit Carrier Board , Programmed
1	CPT-136-1222	Relay Driver Assembly
1	LCM-S02402DSF	LCD & Backlight Module
1	ECL15US24-S	Power Supply, 24V
1	ECL15US05-T	Power Supply, 5V
1	QK4-943G70L	Switch, Coaxial Relay, SP4T
2	557-1412-203F	LED Green
1	0312002.HXP	3AG Fuse 250V 2A Fast Acting

SS-2001-32X1-MW-S

Part Number: PL-CPT-165-1210

Specification	Conditions	Min	Max	Units
Frequency Range		DC	18.0	GHz
Insertion Loss	DC – 4 GHz		1.0	dB
	4 – 8 GHz		1.3	dB
	8 – 12.4 GHz		1.6	dB
	12.4 – 18 GHz		2.0	dB
Isolation	DC – 4 GHz	65		dB
	4 – 8 GHz	65		dB
	8 – 12.4 GHz	60		dB
	12.4 – 18 GHz	60		dB
VSWR (50Ω Reference)	DC – 4 GHz		1.5:1	
	4 – 8 GHz		1.6:1	
	8 – 12.4 GHz		1.7:1	
	12.4 – 18 GHz		2.0:1	
Signal Level CW			30	Watts
Temperature (Op)		0	50	°C
AC Voltage	47 – 63 Hz	90	264	VAC
Power Consumption			12	W
Weight			15	Lbs.

Dimensions : 19" x 14.75" deep x 3.50" high (nominal)
 Switch Type : Coaxial Relay – Normally Open
 Control : RS232 or RS422 Selectable, Ethernet, and Front Panel Keypad
 RF Connectors: SMA Type - Female In and Out



SS-2001-32X1-MW-S Front and Rear Panelst

Connector List

Ref	Connector Type	Name
Input Switch (1-8) Port 1	SMA -F	Input 1 ¹
Input Switch (1-8) Port 2	SMA -F	Input 2 ¹
Input Switch (1-8) Port 3	SMA -F	Input 3 ¹
Input Switch (1-8) Port 4	SMA -F	Input 4 ¹
Input Switch (1-8) Port 5	SMA -F	Input 5 ¹
Input Switch (1-8) Port 6	SMA -F	Input 6 ¹
Input Switch (1-8) Port 7	SMA -F	Input 7 ¹
Input Switch (1-8) Port 8	SMA -F	Input 8 ¹
Input Switch (9-16) Port 1	SMA -F	Input 9 ¹
Input Switch (9-16) Port 2	SMA -F	Input 10 ¹
Input Switch (9-16) Port 3	SMA -F	Input 11 ¹
Input Switch (9-16) Port 4	SMA -F	Input 12 ¹
Input Switch (9-16) Port 5	SMA -F	Input 13 ¹
Input Switch (9-16) Port 6	SMA -F	Input 14 ¹
Input Switch (9-16) Port 7	SMA -F	Input 15 ¹
Input Switch (9-16) Port 8	SMA -F	Input 16 ¹
Input Switch (17-24) Port 1	SMA -F	Input 17 ¹
Input Switch (17-24) Port 2	SMA -F	Input 18 ¹
Input Switch (17-24) Port 3	SMA -F	Input 19 ¹
Input Switch (17-24) Port 4	SMA -F	Input 20 ¹
Input Switch (17-24) Port 5	SMA -F	Input 21 ¹
Input Switch (17-24) Port 6	SMA -F	Input 22 ¹
Input Switch (17-24) Port 7	SMA -F	Input 23 ¹
Input Switch (17-24) Port 8	SMA -F	Input 24 ¹
Input Switch (25-32) Port 1	SMA -F	Input 25 ¹
Input Switch (25-32) Port 2	SMA -F	Input 26 ¹
Input Switch (25-32) Port 3	SMA -F	Input 27 ¹
Input Switch (25-32) Port 4	SMA -F	Input 28 ¹
Input Switch (25-32) Port 5	SMA -F	Input 29 ¹
Input Switch (25-32) Port 6	SMA -F	Input 30 ¹
Input Switch (25-32) Port 7	SMA -F	Input 31 ¹
Input Switch (25-32) Port 8	SMA -F	Input 32 ¹
Output	SMA -F	Output 1 (Common) ¹
AC POWER	4301.0501	AC Power Input 90 – 264 VAC, 47-63 Hz
SERIAL CONTROL	D-9	Serial Control
ETHERNET	RJ-45	Ethernet Control
GND	Stud	Ground

¹ This product is bi-directional. Input and Output ports may be reversed for a 1x32 configuration.

Rear Panel AC Fuses

Ref	Part Number	Name
AC FUSE	0217004.HXP	FUSE 4A 250V 5X20MM IEC FAST ACTING

Replaceable Parts

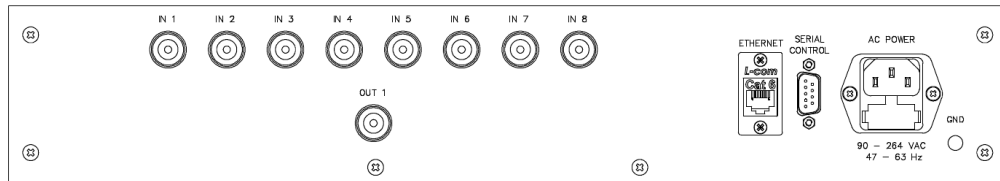
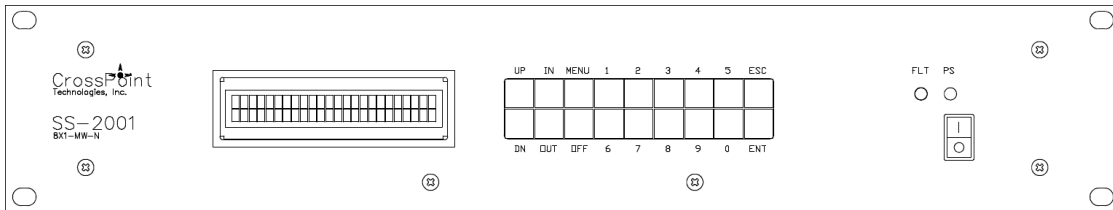
Qty Used per	Part Number	Description
1	CPT-165-1224	Rabbit Carrier Board , Programmed
1	CPT-018-1222	Relay Driver Assembly
1	LCM-S02402DSF	LCD & Backlight Module
1	CPT-006-1222	ASSEMBLY, KEYPAD
5	CPT-018-1222	ASSEMBLY,RELAY DRIVER
1	CPT-018-1245	ASSEMBLY,BACKPLANE CONTROLLER
1	ECM60US24	Power Supply, 24V
1	ECL10US05-T	Power Supply, 5V
1	545J-5308	Switch, Coaxial Relay, SP4T, Normally Open
4	581J-5308	Switch, Coaxial Relay, SP8T, Normally Open
2	0217004.HXP	FUSE 4A 250V 5X20MM IEC FAST ACTING

SS-2001-8X1-MW-N

Part Number: PL-CPT-214-1210

Specification	Conditions	Min	Max	Units
Frequency Range		DC	18.0	GHz
Insertion Loss	DC – 4 GHz		0.6	dB
	4 – 8 GHz		.95	dB
	8 – 12.4 GHz		1.2	dB
	12.4 – 18 GHz		1.9	dB
Isolation	DC – 4 GHz	70		dB
	4 – 8 GHz	65		dB
	8 – 12.4 GHz	60		dB
	12.4 – 18 GHz	55		dB
VSWR (50Ω Reference)	DC – 4 GHz		1.4:1	
	4 – 8 GHz		1.6:1	
	8 – 12.4 GHz		1.7:1	
	12.4 – 18 GHz		2.0:1	
Signal Level CW	DC – 4 GHz		100	Watts
	4 – 8 GHz		70	Watts
	8 – 12.4 GHz		60	Watts
	12.4 – 18 GHz		45	Watts
Temperature (Op)		0	50	°C
AC Voltage	47 – 63 Hz	90	264	VAC
Power Consumption			12	W
Weight			15	Lbs.

Dimensions : 19" x 14.75" deep x 3.50" high (nominal)
 Switch Type : Coaxial Relay – Normally Open
 Control : RS232 or RS422 Selectable, Ethernet, and Front Panel Keypad
 RF Connectors: Precision N Type - Female In and Out



SS-2001-8X1-MW-N Front and Rear Panels

Connector List

Ref	Connector Type	Name
IN 1	Precision N -F	Input 1 ¹
IN 2	Precision N -F	Input 2 ¹
IN 3	Precision N -F	Input 3 ¹
IN 4	Precision N -F	Input 4 ¹
IN 5	Precision N -F	Input 5 ¹
IN 6	Precision N -F	Input 6 ¹
IN 7	Precision N -F	Input 7 ¹
IN 8	Precision N -F	Input 8 ¹
OUT 1	Precision N -F	Output 1 (Common) ¹
AC POWER	4301.0501	AC Power Input 90 – 264 VAC, 47-63 Hz
SERIAL CONTROL	D-9	Serial Control
ETHERNET	RJ-45	Ethernet Control
GND	Stud	Ground

¹ This product is bi-directional. Input and Output ports may be reversed for a 1x8 configuration.

Rear Panel AC Fuses

Ref	Part Number	Name
AC FUSE	0217004.HXP	FUSE 4A 250V 5X20MM IEC FAST ACTING

Replaceable Parts

Qty Used per	Part Number	Description
1	CPT-214-1224	Rabbit Carrier Board , Programmed
1	CPT-018-1222	Relay Driver Assembly
1	LCM-S02402DSF	LCD & Backlight Module
1	CPT-012-1222	ASSEMBLY, KEYPAD
1	ECM60US24	Power Supply, 24V
1	ECL10US05-T	Power Supply, 5V
1	581J-5308-ROHS	Switch, Coaxial Relay, SP8T, Normally Open
2	0217004.HXP	FUSE 4A 250V 5X20MM IEC FAST ACTING