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# Secure Console Servers

## SCS and SCS-R Models Product Manual

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Revision C



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## 1 Introduction

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*Introducing the Logical Solutions Inc. Secure Console Servers*

### 1.1 SCS Models Covered in this Manual

All Logical Solutions Secure Console Server (SCS) models covered in this manual are similar in physical appearance, setup and functionality.

**Figure 1.1** Logical Solutions SCS160, 16-Port Secure Console Server, front and rear view



- Model SCS160 - 16-Port 1U Secure Console Server (shown above)
- Model SCS320 - 32-Port 1U Secure Console Server
- Model SCS480 - 48-Port 1U Secure Console Server
- Model SCS160R - 16-Port 1U Redundant Power Secure Console Server
- Model SCS320R - 32-Port 1U Redundant Power Secure Console Server

The SCS160R and SCS320R models are designed with dual hot-swappable AC Power Modules which operate in a redundant manner, and also offer two Network Ports and two Console port connections. The 'R' models are otherwise very similar to the SCS160 and SCS320.

*Figure 1.2 SCS160R Secure Console Server, front and rear views*



The following SCS models are available for International customers, and are shipped with regionally-appropriate AC power cordsets (otherwise similar to the SCS160 / SCS320 / SCS480, respectively).

- Model SCS1601 - 16-Port 1U Secure Console Server, International
- Model SCS3201 - 32-Port 1U Secure Console Server, International
- Model SCS4801 - 48-Port 1U Secure Console Server, International

## 1.2 System Features

Each SCS system includes the following features:

- Linux operating system and command set
- Connect as many as 16, 32 or 48 EIA-232 serial console ports
- 10baseT / 100baseTX network compatible
- Preconfigured from the factory – two minutes from the box
- Uses OpenSSH (version 2) security
- Supports NFS and NIS
- Supports ssh to a Serial Port
- Break Safe - no undesired “break” signals are sent to attached servers

The **SCS-R** models also offer the following additional features:

- Dual Hot-Swappable Redundant AC Power Modules (rear access)
- Dual 10baseT / 100baseTX Network Port interfaces
- Dual Console Port interfaces (one DTE, one DCE)
- AC Power Monitoring for notification of AC Module outage

*Figure 1.3 SCS320 Secure Console Server (32 Ports), front and rear views*



## 1.3 Software Features

The SCS is designed with network administrators in mind. No need for special administration tools, training or procedures. You know Linux, we run Linux.

- Open-source Linux Operating System (Red Hat distribution)
- Proprietary command-line options for SCS features follow the familiar Linux / UNIX command formats for ease of administration
- Factory pre-configured to be operational out-of-the-box within a few minutes - the sysadmin need only set the IP address and add users

The SCS line allows up to 250 simultaneous user sessions to access up to 48 serial ports. The attached network components may be any variety of network center servers, workstations, or other devices having a serial port that must be monitored.

## 1.4 Hardware Features

The SCS systems are designed for network data center applications, which tend to facilitate mounting a product in industry-standard 19-inch network equipment racks. The SCS may be placed on a shelf or counter, instead. Each SCS operates independently and is accessible (setup by your System Administrator or “sysadmin”) using a secure network connection or a local serial terminal.

- Rack-mount (19 inch), 1U tall (1.75 in./ 4.5 cm) metal chassis
- 16, 32 or 48 serial Ports, using Category 5 (RJ45) connectors
- Front panel LCD with push buttons for network setup
- 10/100 BaseT Network Port for your network
- Console port (uses Category 5 connectors and wiring)
- Universal AC power input (100-240V, 50/60 Hz)
- Convection cooled in your rack enclosure
- 256KB-per-port Buffer memory for Port data

*Figure 1.4 SCS480, 48-Port Secure Console Server, front and rear views*



The SCS can help you troubleshoot your networking environment. The SCS is a "listening" system that monitors the messages (ASCII data, server error information, etc.) from the serial port of the device to which each Port is connected. The SCS captures the data by writing it to a port buffer, each of which can hold 256K bytes of data. This buffered data gives the sysadmin a history of console port messages which can be reviewed to help troubleshoot a problem with the connected device. After you've had a networking device problem, and have access to its console port messages, the problem with your network equipment is easier to fix. Downtime in your network site can be minimized by reviewing the buffered information, and then eliminating the cause of the error messages.

In most cases, the sysadmin has a method of saving the buffered data from each port buffer to some other server (e.g., via NFS) in your network. This is important to note since the Port data (buffered) is stored in RAM and will be lost if the SCS power is turned off.

## **1.4.1 SCS160R / SCS320R Hardware**

The SCS 'R' models offer hardware redundancy for AC Power, Network and Console Ports. Having hot-swappable AC Power Supplies with discrete AC inputs allows the customer to use redundant AC Power Sources to the SCS system, and if necessary, they can field-replace a power module. The SCS-R models provide power supply status to alert the system administrator in the event of a power failure from one of the power supplies.

With Dual NIC inputs and Dual Console Port Inputs, the SCS160R and SCS320R also provide additional benefits for sites needing these capabilities.

## 1.5 Technical Specifications

Each Logical Solutions SCS system is designed to the following specifications:

<b>User Interface</b>	Linux command-line access via ssh or local console port Backlit 2-line front-panel LCD display shows Network configuration Five front-panel push buttons with UI for Network setup
<b>Serial Interface (Ports)</b>	[SCS160 = 16 Ports; SCS320 = 32 Ports; SCS480 = 48 Ports] RJ45-type 8-conductor connector (DTE or DCE; software selectable) Data rate is software selectable from 300 baud to 115KBaud Software selectable EIA-232 parameters 256KB FIFO Buffer in RAM (per Port)
<b>Serial Interface (Console)</b>	160/320/480: RJ45-type 8-conductor connector (DCE configuration) 160R/320R: Dual RJ45-type 8-conductor connector - one DTE, one DCE Data rate is software selectable from 300 baud to 115KBaud Software selectable EIA-232 parameters
<b>Network interface (Network)</b>	160/320/480: 10/100 BaseT RJ45 8-conductor Ethernet 160R/320R: Dual 10/100 BaseT RJ45 8-conductor Ethernet TCP/IP
<b>CPU &amp; Memory</b>	AMD SC520 CPU, operating at 133 MHz 256MB Compact Flash (CF) memory (non-volatile) 128MB RAM for real time use
<b>Power Supply</b>	Universal AC Power Input, 100-240VAC 50/60 Hz, 0.5A each input IEC-type regional cordset(s) included
<b>Dimensions</b>	1U, 1.75 in x 17.25 in x 14.75 in (4.5 cm x 43.8 cm x 37.5 cm)
<b>Weight</b>	4.5 kg (10 lbs)
<b>Temperature</b>	Operating: 0 to 50 °C (32 to 122 °F), 30 to 90% RH, non-condensing Storage: -20 to 70 °C (-4 to 158 °F), 10 to 90% RH, non-condensing
<b>Relative Humidity</b>	Operating: 10% to 90% non-condensing, 40% to 60% recommended Storage: 10% to 90% non-condensing

*Figure 1.5 SCS320R, showing front and rear views*



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## 2 Product Overview

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*Optimize your System Administration and Network Resources*

### 2.1 Intended Application

The Logical Solutions Secure Console Servers are used to securely monitor and centrally manage up to 48 of your networking systems (servers, routers, switches, etc.). They do so by monitoring the Console Port of your network center's devices and systems. Each attached component must have an EIA-232 compatible serial console port. The SCS160 and SCS160R support 16 ports, SCS320 and SCS320R support 32 ports, and the SCS480 supports 48 ports. Security is maintained through encryption and user passwords.

The SCS160R and SCS320R systems are used where redundant power concerns exist, where hot-swap replacement of Power Modules is a concern, or where more than one Network connection or more than one Console Port connection are required.

User accounts are set up by the root user, who acts as the system administrator of the SCS. A user can access the attached servers using commands from a local terminal, or through an ssh-protocol (secure) network connection. In order to interact with a device, the user must have rights for read, review or write access to that port.

Users can interact with each of the attached network devices by logging into the SCS, and entering the **connect** command and the Port number or Port name at the command prompt; the SCS acts as a conduit for the connection but does not interfere. When the user is not interacting with a network system, the SCS can log the output of the Console port to a file, so that data may be reviewed later.

User commands are discussed in *Section 9, User Operations*, beginning on page 71.

## 2.2 System Chassis

Each SCS is housed in the rack-mountable metal chassis. Vents are found on both sides of the chassis, and 3-position rack mount brackets are provided and removable. The front panel of the SCS features a two-line backlit LCD display with push buttons.

### 2.2.1 SCS160 / SCS320 / SCS480

Each SCS chassis has rear-panel connections for 16, 32 or 48 serial ports, one Console port, one Network port, and power. The SCS has a built-in universal AC power supply. A rear-panel power switch and protective fuse is provided.

### 2.2.2 SCS160R / SCS320R

Each SCS-R chassis has rear-panel connections for 16 or 32 serial ports, two Console ports, two Network ports, and two hot-swappable Universal AC Power Modules, each with its own Power switch and protective fuse. Each Power Module is secured with a single screw into the back panel.

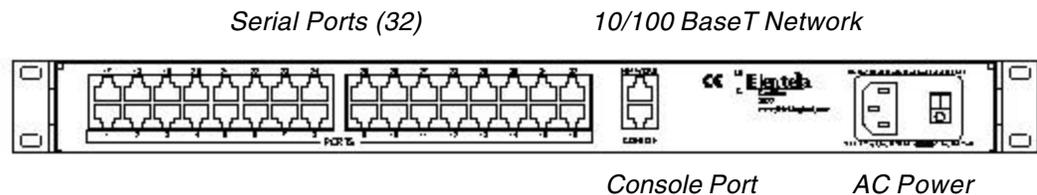
*Figure 2.1 SCS320R Chassis Views; Power Supplies on right rear side of chassis*



## 2.3 Connecting to the SCS

All physical connections to the product are made to the rear panel using industry-standard cabling and connectors (purchased separately). All serial connections and network connections use conventional Category 5 cabling having RJ45 jacks. AC Power is connected using an IEC cordset, one of which is provided with each SCS system.

**Figure 2.2** Rear View of SCS320 Chassis, showing all Connections



Other SCS models are similar, offering a different number of Port connectors. The SCS-R models also have dual NIC, dual Console Ports and dual Power inputs. The rack-mount brackets, shown on each side, may be removed if desired.

### 2.3.1 Serial Devices

All network components attached to both the Ports and the Console port must be compatible with the EIA-232 standard. Regular fully-pinned Category 5 cabling with RJ45 connectors are used for the Port connections and for the Console Port.

System ports (numbered **1** through **48**) are default-configured as DCE data ports, and support a range of baud rates from 300 Baud to 115.2K Baud. All Port parameters, including DTE or DCE type and other data parameters are configurable on a per-port basis. Each port may also be assigned a unique name: default port names are **port1** through **port48**, respectively.

#### 2.3.1.1 Break Safe

The Logical Solutions SCS systems are “break-safe”, meaning that they will not send a ‘break’ command or other data on the serial ports connected to your servers, unless initiated by a user. A ‘break’ signal might cause problems with your servers.

## 2.3.2 IP Network

The SCS network interface is an auto-sensing 10 BaseT/100 BaseTX network connector (equipped with an RJ45 jack with dual LEDs) for use with a conventional TCP/IP network using standard RJ45 Category 5 cables. A default IP address is coded into the system (**10.9.8.7**), however the network settings should be configured by your system administrator to be suitable for your site's requirements and unique equipment. The SCS products are preconfigured for ssh (secure) access.

---

### Note

The SCS-R models offer two independent network interface ports. Only the first port (NETWORK 1) is enabled by default.

---

## 2.3.3 AC Power

### 2.3.3.1 SCS160 / SCS320 / SCS480

A single IEC-type power entry module is located on the rear of the chassis. The power entry module incorporates a replaceable protective fuse (2A) and an On/Off switch. An IEC cordset is provided with each SCS chassis. Connect the cordset to a local AC power source. Turn the power switch on when appropriate.

### 2.3.3.2 SCS160R / SCS320R

Two removable AC Power Modules are found on the rear of the chassis, identified as "Left" and "Right" if looking at the rear of the chassis. Either AC module will fully support the system, and if both are turned on, they operate redundantly. The SCS-R systems have an AC Power Monitoring capability to alert the system administrator in the event of an AC Power outage from one of the modules.

Each AC Module has an IEC-type power entry module. The power entry module incorporates a replaceable protective fuse (2A) and an On/Off switch. Two IEC cordsets are provided with each SCS-R chassis. Connect each cordset to a local AC power source. Turn the power switch on (I) for each module when appropriate.

---

### Caution

During replacement of a module, it is important to first turn the faulty module Off, then remove its power cord, **BEFORE** you remove the screw to allow the module to be pulled out. The potential for handling hazardous voltages could exist otherwise.

---

## 2.4 User Access Control

Access to a Port is controlled on a per-user basis via a user profile, which is stored as a file on the local SCS. This profile is created by the root user using the command 'adduser'. See *Section 8.1.1, adduser*, on page 68.

### 2.4.1 User Sessions

Each SCS supports up to 250 simultaneous user sessions. This is possible since a user can generate multiple sessions. This number of sessions is perceived to be far greater than would be needed in most SCS product applications.

## 2.5 Port Buffers

The Secure Console Servers provide real-time serial port data buffering. Each Port buffer stores up to 256 KB of data in a buffer, held in RAM in a separate file. This provides hundreds of pages of port data for each attached device, which can be reviewed at a later time. The data may be viewed while users are not interacting with the attached port. Port buffers are enabled by default.



*For Your Notes*

---

## 3 Installation

---

*Place it in your Rack. Connect the Cat5 cables to the Ports. Plug it in.*

### 3.1 Mounting the SCS

You may choose to rack mount your SCS unit(s) or place them on a shelf. The front panel display should be visible and front panel buttons need only be accessible for the initial setup of the system. All connections are made to the rear of the chassis.

#### 3.1.1 Rack Mount or Desktop

The SCS products may be installed either in an EIA-standard 19-inch rack (1U tall) or may be placed on a shelf or desktop. For shelf use, rubber feet are provided, and the rack mount brackets may be removed. The SCS chassis does not need to be opened or accessed. The sturdy metal case allows units to be stacked as required.

---

**Note**

Be sure to leave adequate ventilation room on both sides of the SCS chassis, especially if units are being stacked.

---

The rack mount brackets are held on by 4 screws each. They may be positioned so that the unit sits forward, flat or recessed in your rack. If the brackets removed or repositioned, it is not necessary to re-use the extra rack mount screws.

### 3.1.2 Front Panel Display and Buttons

The front-panel LCD display should be visible and accessible during system setup. It normally shows the current network settings and the date/time. The front panel buttons are only used during setup, or to review existing SCS settings.

The LCD display can be customized by the root user. See *Section 7.7, Front Panel Display Options*, on page 57 for more information.

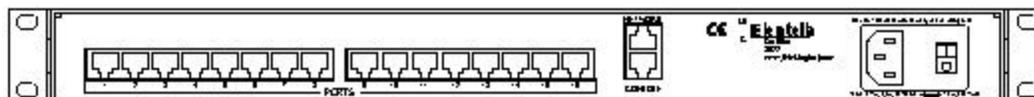
### 3.1.3 It's Convection Cooled

The SCS does not require special cooling or ventilation other than what is normally provided in an equipment rack. No fan means that it does not add to the ambient noise in your equipment room. Be sure to not block the air vents on the sides of the unit, and leave space on both sides. If mounted in an enclosed rack, it is recommended that the rack have a ventilation fan to provide adequate airflow through the unit(s).

## 3.2 Connections

All connections are found on the rear of the SCS chassis. Each Port jack is clearly labeled with the Port number.

**Figure 3.1** SCS160 Chassis Rear View



### 3.2.1 Power

The SCS product has an internal universal AC power supply. Each SCS unit requires approximately 15w of electrical power. The switching power supply accepts nominal AC input voltage between 100-240 VAC with a frequency range of 50/60 Hz.

### 3.2.2 AC Input

A single IEC-type AC power entry module with an integral safety fuse and power switch is found on the rear of the chassis for your AC power input. The power inlet to the chassis uses a removable IEC-type cordset; one is provided with each system. Be sure that your AC Power source is properly grounded.

### 3.2.3 Connecting to the Network Port

Use a conventional fully-pinned Category 5 cable to connect your network connection to the NETWORK jack (RJ45) on the rear of the chassis.

The SCS's network port (auto-selecting 10/100) allows remote access to the attached networking components by the users and the sysadmin functions by the root user. You can change the network parameters from the front panel of the SCS, or you may ssh in to the default address and make changes using Linux commands.

#### 3.2.3.1 SCS160R / SCS320R Dual NIC Interface

The SCS160R / SCS320R has dual Network Ports. The default configuration of these Network Ports has the second Network Port disabled. Initially, only the first NIC is functional (NETWORK 1 = device `eth0`). The second NIC (NETWORK 2 = device `eth1`) must be enabled by the sysadmin.

To configure the second NIC, the sysadmin will log in and use one of the following commands:

```
netconfig -d eth1
```

or

```
netconfig --device=eth1
```

Refer to Section 6 for other System Commands.

### 3.2.4 Connect your Console

The Console port is used for local access to the SCS. Connect your terminal or computer with a terminal emulation package to the Console port. The SCS's Console port has a DCE configuration with adjustable parameters.

The default communication parameters for the Console port are:

- **9600 baud,**
- **8 data bits,**
- **No parity,**
- **1 stop bit, and**
- **Xon/Xoff flow control**

Use a conventional fully-pinned Category 5 cable to connect your terminal or computer connection to the CONSOLE jack (RJ45) on the rear of the chassis.

### 3.2.4.1 SCS160R / SCS320R Dual Console Interface

The SCS160R / SCS320R has dual Console Ports, with the Console Port 1 pinned as DCE and the Console Port 2 pinned as DTE. The default configuration of these Console Ports has the second Console Port disabled. To use the second Console port, the root user must enable it.

The second console port is activated by editing the file `/misc/inittab`.

Refer to Section 6 for other System Commands.

### 3.2.5 Connect to the Ports

Any system (e.g., server, router, switch) with a serial port may be connected to the SCS for consolidated system administration. Server Ports are individually configurable. Consult your server documentation, as necessary.

The default communication parameters for the server Ports are:

- **9600 baud,**
- **8 data bits,**
- **No parity,**
- **1 stop bit,**
- **Xon/Xoff flow control, and**
- **Port type of DCE**

Each Port can be individually configured for baud rates of 300-115,200 baud, the data parameters and as DTE or DCE types.

---

**Note**

Ports may also be individually disabled, if desired.

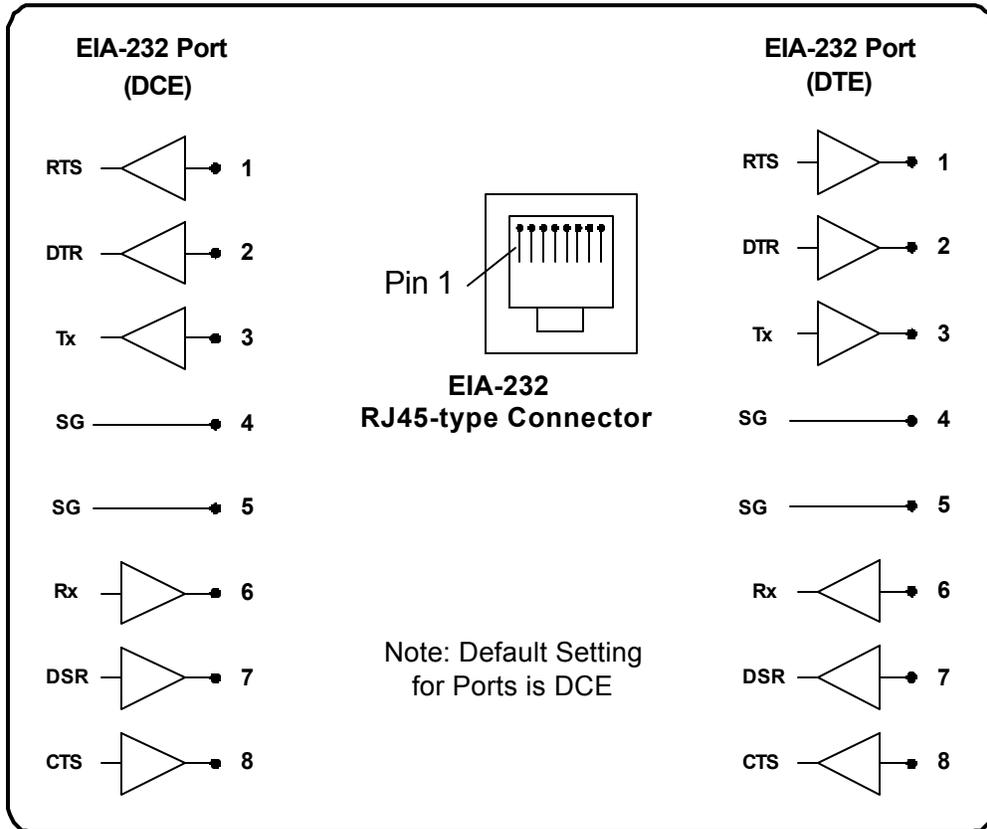
---

#### 3.2.5.1 Port Adapters

You may need to adapt the cable connection for your server device. Logical Solutions offers serial-to-RJ45 adapters for serial ports, both DB9 and DB25, for many common network-equipment product applications.

**3.2.5.2 Serial Port Pinout**

*Figure 3.2 Serial Port Pinout - DCE (default) and DTE*



Use a conventional fully-pinned Category 5 cable to connect the Console Port from each of your networking components to the Port jacks on the rear of the chassis.

### 3.3 SCS160R / SCS320R Power Modules

The SCS160R and 320R provide dual AC power inputs which are field-replaceable, which connect to the rear panel of the SCS chassis. Each Power Module has a power entry connection with an IEC-type power connector. The SCS160R and SCS320R have a Power Monitoring display shown on the front panel to indicate if one of the power supplies is not powering the system (either AC power failure, a Module is turned off, or the supply has failed).

---

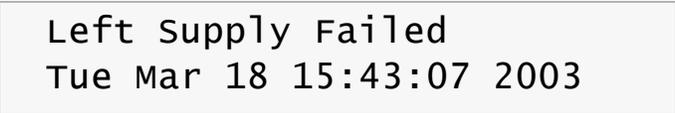
**Note**

The Power Module in the SCS160/320/480 is not field serviceable. This option only applies to the SCS160R and SCS320R.

---

Each Power Module can support the SCS160R/SCS320R system fully, however the intended design is to have two AC power sources to keep your SCS system running in the event one of your commercial AC sources fails. When both supplies are active, they will share the system load. If one fails, the remaining supply takes the load.

**Figure 3.3** SCS Front Panel Display, Left AC Power Module Failed

A rectangular display box with a light gray background and a thin black border. It contains the text "Left Supply Failed" on the first line and "Tue Mar 18 15:43:07 2003" on the second line, both in a black, sans-serif font.

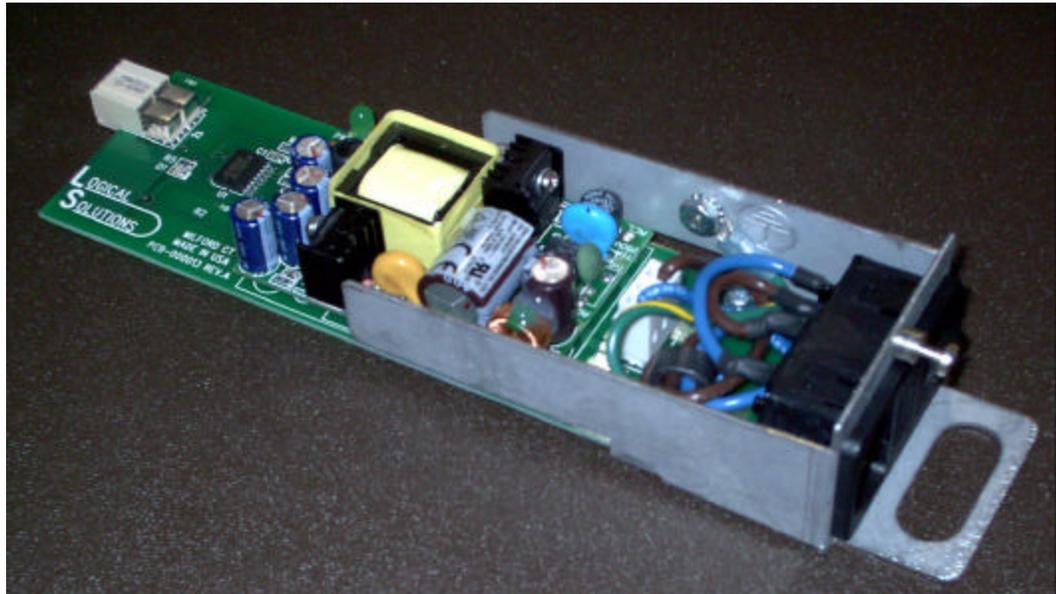
Left Supply Failed  
Tue Mar 18 15:43:07 2003

The SCS160R and SCS320R ships with two AC power cordsets, one for each module, to allow separate AC power source connection. Plug in the IEC connection to the SCS Power Module, and connect the AC plug to an acceptable AC power source.

### 3.3.1 AC Power Module Replacement

The AC Power Modules of the SCS160R and SCS320R may be hot-swapped if necessary by a competent technician. Each slide-in power module is held in place with a single screw and does not need to be removed except for replacement.

**Figure 3.4** AC Power Module (shown removed from SCS-R)



If you need to replace one of the power supply modules, determine which module has failed (left or right, if looking at the rear of the chassis) by reading the front panel display. The module slides in from the rear of the chassis.

A single captive screw (visible from the rear of the chassis) holds the AC Power Module in place, and also establishes a protective Earth ground connection for the system. Be certain to turn off the failed Power Module (switch on Module to O position), then remove its power cord connection. You can then unscrew that Module and pull it firmly from the chassis using the metal loop on the module.

**Figure 3.5** Replacing an AC Module (Left Module shown partially removed)



---

**Note**

To remove the AC Module, you only need to loosen the one captive screw on the Module. You do not need to remove the chassis from your rack, or remove the cover of the chassis for any reason. The photo above shows the cover removed for clarity only.

---

Insert the replacement Power Module in its place (it will require a slight amount of force to insert), and tighten the screw. After the screw is tightened, reconnect the IEC cordset to the Module, and then you can turn the switch on the Module to the On (I) position. When proper power is restored, the front panel display indicating a module has failed will clear after a few moments.

---

## 4 Initial Configuration

---

*It's Pre-Configured. Set your IP Address. Just Add Users.*

### 4.1 Default Configuration

Out of the box, the SCS is pre-configured, ready to generate ssh keys, and has an IP address set to a generic default value of **10.9.8.7** / NetMask **255.0.0.0**. It is likely that the sysadmin will want to change from this default IP address to your local IP information. The sysadmin will only need to add user information specific to his site.

---

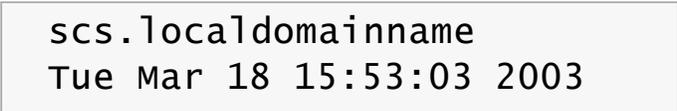
**Note**

The default IP address of the SCS is 10.9.8.7, with a default subnet mask of 255.0.0.0.

---

When you first connect the unit to your network and turn the power on, it will take about two minutes for the SCS to perform the initial ssh host key generation. The front panel display will show the following display after the SCS's power-up is complete and the system is ready.

**Figure 4.1** SCS Front Panel Display, default, normal mode shown



```
scs.localdomainname  
Tue Mar 18 15:53:03 2003
```

The top line of the display is the SCS's network and domain name, while the second line is a clock display showing day and date (initially set to Eastern Time Zone).

## 4.2 Initial System Security Concerns

The first login will require several steps to fully secure the SCS.

When you first connect the SCS and turn it on, the SCS will build the ssh host keys during the first two minutes of system startup. During this time, the front panel LCD bottom line reads '`start sshd`', and the console port reads 'Starting sshd'. The system is not dead or locked up, but is generating ssh host keys.

The root user should also configure the `ntp` and the `ssh` files.

## 4.3 Initial Connection via Network

You can access the SCS using `ssh` commands using your existing network. If you add a route to your workstation, you can connect to the SCS via its default address.

### 4.3.1 Network Connection Requirements

- Have your SCS system connected to your network, and turn it on.
- Know your computer's IP address

### 4.3.2 Route via Linux workstation

If using a Windows workstation, go to the next section.

If you are accessing the network from your Linux / Unix workstation, enter:

```
route add -net 10.9.8.7 netmask 255.255.255.255 gw <your workstation's IP address>.
```

Now, from your command line, to access the SCS system using ssh, enter:

```
ssh root@10.9.8.7
```

You should be at the SCS's root command prompt now.

You should change your SCS's network address as one of the first changes you make. See *Section 7.2, Change Network Address*, on page 53.

### 4.3.3 Route via Windows workstation

If using a Linux workstation, ignore this section.

If using Windows 9x/2000/XP, you can connect to the SCS using your networked Windows PC and an ssh-capable terminal emulation package.

---

**Note**

If you don't have an ssh-capable terminal package, try using PuTTY, a freely-distributed package you can download at <http://www.chiark.greenend.org.uk/~sgtatham/putty/>.

---

If you must use a Windows PC to login to the SCS, do the following:

1. Determine your PC's IP network address.  
One method: open a DOS prompt window and type `ipconfig`, and press Enter. Your PC's IP address is listed, among other things.
2. Add the route between the PC and the SCS.

From a DOS prompt, enter:

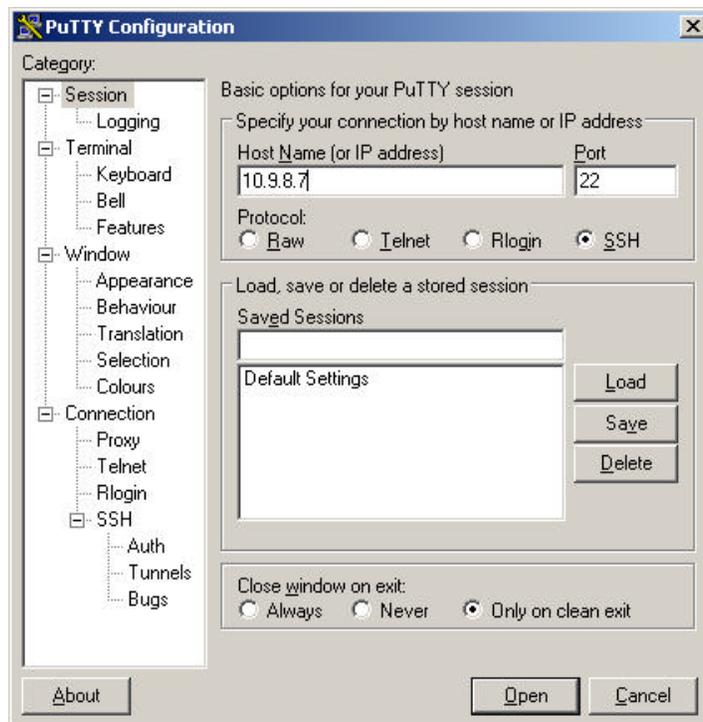
```
route add 10.9.8.7 mask 255.255.255.255 <workstation's IP  
address> [press Enter]
```

3. Ping the SCS to be sure that your network connection is now functioning.  
Verify that this route now functions by typing `ping 10.9.8.7` at the DOS prompt, and pressing Enter. Review the results for a positive response.
4. Connect to the SCS using your terminal package, using ssh.

Launch your terminal package, and connect to the default IP address of the SCS of `10.9.8.7` using ssh.

If using PuTTY (shown below), set the Session window IP address to 10.9.8.7, and select the ssh radio button, and press 'Open'.

Figure 4.2 PuTTY Configuration Screen



The first time you connect using ssh, you will get a warning about the ssh authentication keys. Accept the newly-generated keys by choosing **'yes'**.

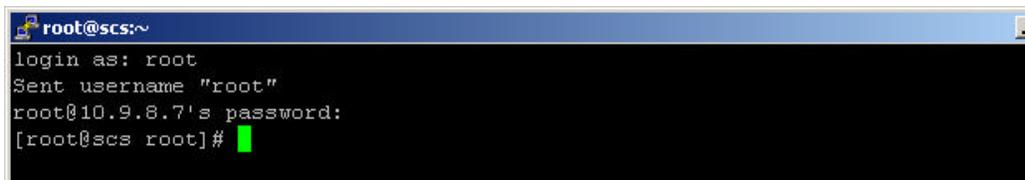
#### 5. Login to the SCS

When connected to the SCS, the **'login as:'** prompt will appear. You want to log in as **root**. Press Enter to continue.

The **'password:'** prompt comes up next. Enter **root** (the default root password) and press Enter.

You should be at the SCS's root command prompt after pressing the Enter key. In our case, we connected using PuTTY to ssh into 10.9.8.7:

Figure 4.3 Terminal screen, showing a typical root login to SCS



When successfully logged in, you will see the command prompt ending with # followed by your cursor.

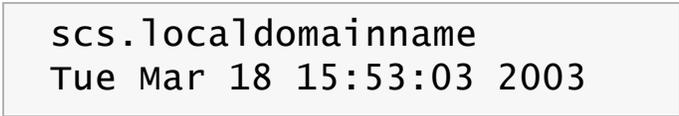
You should change your SCS's network address as one of the first changes you make. See *Section 7.2, Change Network Address*, on page 53.

## 4.4 Front Panel Network Setup

If you changed the Network settings via netconfig, you can skip this section.

By default, the Front Panel Display and buttons can be used to set the basic network parameters. There is one 'ENTER' button and four arrow buttons (Left, Right, Up and Down). The front panel can change the IP Address, Subnet Mask, and Gateway settings. By default, the front panel will show the Hostname and the Date/Time.

**Figure 4.4** Default Normal Front Panel Display (Hostname and Date/Time)



```
scs.localdomainname
Tue Mar 18 15:53:03 2003
```

### 4.4.1 Front Panel Edit Mode

By default, the Front Panel Display's Edit mode is enabled. The **View Mode** is similar to **Edit mode** except that the front panel cannot be used to change the settings. This is described in *Section 7.7, Front Panel Display Options*, on page 57 of this manual.

---

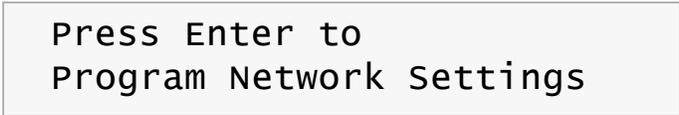
**Note**

The Front Panel Edit Mode can be disabled, if required. See *Section 7.7, Front Panel Display Options*, beginning on page 57.

---

With Edit mode enabled, use the arrow buttons on the front panel to access the **front panel edit** subroutine and change the default network settings (showing the IP address, Netmask, and Gateway) for your SCS system. The front panel controls are self-prompting for the appropriate entries.

**Figure 4.5** SCS Front Panel Display, showing first LCD Mode display



```
Press Enter to
Program Network Settings
```

---

**Note**

Use the ENTER button to 'continue' or to 'accept current setting', whichever is appropriate at that time.

---

Your front-panel entries must be no longer than 30 seconds apart, or the front panel entry program will time out and discard any of your entries. An asterisk to the far right indicates there is a parameter that has changed from the currently-stored value. Your entries will be accepted and held; then, as you are exiting this programming mode, you are given the opportunity to Save or Cancel your new changes. If you do not Save your settings at this time, your new changes will be discarded.

---

**Note**

Front panel changes are not written to the Compact Flash memory until the sysadmin uses the command-line 'save' command. Therefore, do NOT turn the system power off or these changes will be lost.

---

#### 4.4.1.1 Start Front Panel Edit Mode

To start the Edit mode, press the **UP** or **DOWN** Arrow button on the front panel. The display will change from the default Domain Name / Date & Time to the Edit Mode. This mode will time out after 30 seconds, and revert to the normal display.

*Figure 4.6 SCS Front Panel Display, showing first Edit Mode display*



Press Enter to  
Program Network Settings

You can scroll through the Edit functions (plus the normal display) that are available by pressing the UP or DOWN arrows:

- Program Network Settings
- View SCS Settings

---

**Note**

If you do not press any buttons, the display will revert to the normal display in approximately 30 seconds, and no changes will be made.

---

Stop scrolling when you reach the **Program Network Settings** display.

### 4.4.1.2 Program Network

When you select the Program Network Settings mode, you step through the parameter entry for Network IP Address, Net Mask and Gateway, and Exit to the previous menu. The Up and Down arrows are used to scroll through the available options.

#### Network IP Address

*Figure 4.2 SCS Front Panel Display, for Network Programming mode*

```
Press Enter to
Program Network Settings
```

Press the ENTER button to continue.

*Figure 4.3 SCS Front Panel Display, showing the current IP Address*

```
IP Address
010.009.008.007
```

The current IP Address will be displayed, shown with leading zeroes. The factory default is 10.9.8.7. If you do nothing, the display will revert to the previous display after 30 seconds, and no changes will be made.

Let's change the IP Address. Press the ENTER button to continue.

*Figure 4.4 SCS Front Panel Display, showing Edit IP Address*

```
Edit IP Address
010.009.008.007
```

A cursor appears under the first character of the existing address. Press the Left or Right arrow button to move the cursor to the first digit to be changed. To change a digit, use the Up or Down arrows to change the number.

---

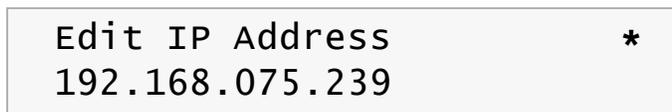
**Note**

Ignore any leading 0's in the display entry. The SCS will adjust for them and will not store the leading zeroes when saving the data.

---

As soon as you change a digit, an asterisk (\*) will appear to the right on the top line, indicating that a parameter has changed.

**Figure 4.5** SCS Front Panel Display, Asterisk indicating a change



When you have the complete parameter value as it should be, press the ENTER button to complete the entry.

The display will show the following:

**Figure 4.6** SCS Front Panel Display, after editing the IP Address



Your new value will be stored when you are finished setting all the Network parameters.

## Net Mask

Press the **Down Arrow** once to advance to the Net Mask parameter.

**Figure 4.7** SCS Front Panel Display, showing the current Net Mask



Press the ENTER button to change the Net Mask parameter. The current Net Mask setting will be displayed, with a cursor under the first digit. The factory default is 255.0.0.0.

Press the Left or Right arrow button to move the cursor to the first digit to be changed. To change a digit, use the Up or Down arrows to change the number.

**Figure 4.8** SCS Front Panel Display, editing the Net Mask setting

```
Edit Net Mask *  
255.200.000.000
```

As soon as you change a digit, an asterisk (\*) will appear to the right on the top line, indicating that a parameter has changed. Change the Net Mask as desired.

---

**Note**

Ignore any leading 0's in the display entry. The SCS will adjust for them and will not store the leading zeroes when saving the data.

---

When you have the complete parameter value as it should be, press the 'ENTER' button to complete the entry. The display will show the following:

**Figure 4.9** SCS Front Panel Display, showing the new Net Mask display

```
Net Mask  
255.255.000.000
```

Your new value will be stored when you are finished setting all the Network parameters.

**Gateway**

Now, enter your Gateway parameter information. Press the **Down Arrow** once to continue.

**Figure 4.10** SCS Front Panel Display, showing the current Gateway setting

```
Gateway  
010.001.002.003
```

Press the ENTER button to edit the Gateway parameter. The current Gateway setting will be displayed, with a cursor under the first digit.

**Figure 4.11** SCS Front Panel Display, Edit the Gateway setting

```
Edit Gateway
010.001.002.003
```

Press the Left or Right arrow button to move the cursor to the first digit to be changed. To change a digit, use the Up or Down arrows to change the number. As soon as you change a digit, an asterisk (\*) will appear to the right on the top line, indicating that a parameter has changed.

---

**Note**

Ignore any leading 0's in the display entry. The SCS will adjust for them and will not store the leading zeroes when saving the data.

---

**Figure 4.12** SCS Front Panel Display, editing the Gateway setting

```
Edit Gateway
192.168.102.001
```

When you have the complete parameter value as it should be, press the 'ENTER' button to complete the entry. The display will show the following:

**Figure 4.13** SCS Front Panel Display, showing new Gateway setting

```
Gateway
192.168.102.001
```

Your new value will be stored when you are finished setting all the Network parameters.

**Exit to Main Menu**

You are now prompted to Exit to the Main Menu. Press Enter to continue.

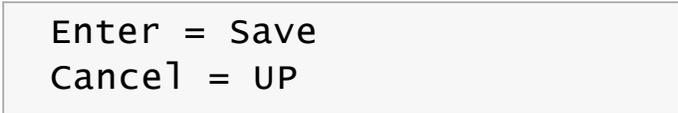
**Figure 4.14** SCS Front Panel Display, exiting the LCD Mode



Exit to Main Menu

You are given the choice to Save your changes or to Cancel them.

**Figure 4.15** SCS Front Panel Display, Save or Cancel Changes



Enter = Save  
Cancel = UP

Press '**ENTER**' to save your network changed, or press the **Up Arrow** to discard them. When you are done with your network settings, and have made changes, the system must restart the network daemon. Progress of this process will be displayed on the front panel display, and you will see a normal display when the network is restored.

**Figure 4.16** SCS Front Panel Display - Saving and Restarting



Saving and Restarting  
Network Services

When the system is done restarting the network services, the display will show:

**Figure 4.17** Returned to normal SCS Front Panel Display



Save / Reset Complete  
Any Key to Continue

To permanently save your new Network settings in the system, you must use the save command (described later) to write the values to the Compact Flash memory.

Note that if your system loses power before you use the command-line 'save' command, your front-panel-entered network parameters changes will be lost.



*For Your Notes*

---

## 5 System Administration

---

### 5.1 SCS Systems are Linux-based

The Logical Solutions Secure Console Server products use the GNU/Linux operating system.

#### 5.1.1 Linux General Public License

The GNU/Linux source code used in this product has been distributed under a General Public License (GPL) from the Free Software Foundation. You may read about the GNU GPL by reviewing the text version of the GPL, which can be found at <http://www.gnu.org/licenses/gpl.txt>.

You will find additional GNU license information online at <http://www.gnu.org/licenses/licenses.html#GPL>.

Please contact Logical Solutions Product Support, should you need to obtain a copy of this source code.

#### 5.1.2 Understanding Linux

Each SCS system is a “Linux box”, meaning you will use Linux commands to administer it. We must assume a certain level of Linux understanding for our audience. If you do not know your way around Linux, you may have some difficulties and might want to get some Linux help. This document is not meant to teach you all about Linux or the other applications and features available since this system is running Linux. Those that use this type of system and know Linux should have no trouble configuring the SCS.

### 5.1.3 SCS System Architecture

The SCS software design uses both RAM (volatile) and Compact Flash (non-volatile) memory. Any system changes are maintained in RAM until they are written to the Compact Flash memory. A read-only memory system is used since Compact Flash memory devices have a limited number of read-write cycles.

After making administrative changes to the system, the root user must run the **save** command to write the changes to the non-volatile memory. If the data changes are not **saved**, the parameter changes will be lost in the event of a power failure.

## 5.2 Initial Sysadmin Access

When the SCS is first powered up, you may want it to be configured to operate with your network. You will use ssh to access the SCS.

The SCS product uses familiar Linux commands to administer the system. This manual will list those Linux commands that are important for the SCS sysadmin to know; other Linux / UNIX commands are discussed in a myriad of Linux reference and training manuals.

### 5.2.1 Connect using a Terminal

Connect the SCS's Console port to your terminal, or to a computer using a terminal emulation program. When you successfully connect with the SCS, your terminal will show the header and login prompt:

**Figure 5.1** SCS login display (default)

```
Logical Solutions Inc  Secure Console Server
Kernel xxxxxxxxxxxx on an i486

scs.localdomain login:
```

Later, after you change your SCS's Hostname, your new hostname information will be shown in your login line (in place of **scs.localdomain**, above).

## 5.2.2 Log In as root

At the command prompt, type **root** to access the SCS as the root user. The default password is **root**.

---

**Note**

The root user should change the default root password (use the `passwd` command) as soon as possible to prevent undesired SCS system access.

---

You will see the short Hostname (e.g., “**scs**”) in the root login (**#**) prompt.

**Figure 5.2** SCS login display, showing root user logged in

```
Logical Solutions Inc  Secure Console Server
Kernel xxxx

scs.localdomain login: root
Password:

[root@scs root]#
```

## 5.2.3 Enter Commands

The system administrator enters Linux commands using the command-line interface. Unless otherwise shown, commands are all lower-case and may have modifiers. SCS commands are discussed in *Section 6, Commands*, beginning on page 47.

## 5.2.4 Log Out

To log out from a session, use the command **logout**. If logging out from a network session, the Console Server will disconnect the ssh session.

## 5.3 Default Services

The following Services are enabled by default:

- network
- ssh
- syslog
- cron

You may add other features and services, depending on your application. When you first log into the system, you will get a reminder message for configuration:

**Figure 5.3** SCS login advice (displayed on-screen when you first log in)

```
To customize the SCS configuration for your location,
we suggest you do the following:

* CHANGE THE ROOT PASSWORD!!!
* reconfigure the network    (netconfig)
* set the timezone, if not in the Eastern U.S.  (timeconfig)
* add users                  (adduser)
* edit the ntp.conf file and then enable the ntpd service

For extra security:

* edit the sshd_config file to not allow root logins

* when all settings are changed, reboot the system to save any
changes
```

### 5.3.1 Configure the Services

To configure the existing features, use the following commands:

For the Network parameters, use **netconfig**

To change the host and domain name, use **changehostname**

For the Date/Time, use **timeconfig**

For the authentication protocols, use **authconfig**

### 5.3.1.1 Configure the Services

When you first install the SCS system, you should configure the default services for your needs. This addresses the network, the date/time, authorizations, and the system hostname. The feature commands described below are discussed in *Section 7, System Administration*, beginning on page 53.

In order to properly configure the basic services, you must:

1. make all of the changes to the commands (`netconfig`, `changehostname`, `timeconfig`, `authconfig`).
2. run `save`
3. run `service network restart` to restart the system clock
4. The next time that you ssh in, you will need to make a new ssh connection.



*For Your Notes*

---

## 6 Commands

---

*A summary of special SCS Commands*

### 6.1 System Commands

The SCS products use Linux command formats, and `man` pages are available and online for all system commands. The root user can access the following commands to configure the special features of the SCS:

COMMAND	PURPOSE	CH.
<code>adduser</code>	Add a User (creates a new user account)	8
<code>deluser</code>	Delete a User account	8
<code>editbrk</code>	Edit the 'break' sequence	8
<code>editesc</code>	Edit interactive mode 'escape' sequence	8
<code>edituser</code>	Edit user settings for existing User accounts	8
<code>lsp</code>	list port names	
<code>lsc</code>	list active connections	
<code>save</code>	Commit your programming changes to non-volatile memory	6
<code>stty</code>	Configure Port parameters (see Linux commands)	
<code>versions</code>	Show version information	

The commands are discussed in the Chapter numbers noted.

---

## 6.2 save Command

The SCS systems will maintain your settings in RAM memory as long as system power is applied and the system remains in a normal operating condition. To permanently store your parameters, the system has a **save** command. In order to prevent the inadvertent loss of your precious data due to an inadvertent power failure, the root user must use the **save** command to write the data changes to the non-volatile Compact Flash memory card. This will ensure your data is maintained as desired.

The **save** command does not store buffered port data, which is held in RAM.

---

### Note

The root user should run **save** any time that the system configuration has been changed. This includes user password changes and any command-line system administration changes

---

The **save** command is automatically run when you have executed the **reboot** or the **poweroff** commands.

## 6.3 reboot

During the course of administering the SCS, you may have to reboot the system to enable certain changes. For example, certain network settings require the **service network restart**, which is accomplished during a reboot.

**reboot** may be manually run at any time, if required. The **save** command is auto-run as a part of the reboot command. Reboot occurs immediately after your data has been saved. After the reboot has properly run the underlying commands, the system will 'reset' and then begin the start up process, as if you had just turned the power on.

---

### Note

No 'break' commands will be sent on the serial Ports during a SCS system reboot. Your servers will not be adversely affected.

---

The Logical Solutions SCS systems are "break-safe", meaning that they will not send a 'break' command (unless user initiated) or other data on the serial ports connected to your servers. A 'break' might cause problems with your server.

A **reboot** takes a short period of time, a minute or so, to complete.

## 6.4 poweroff

If you want to turn the system power off (e.g., to move the chassis, etc.) you must first run the **poweroff** command before turning the power switch off.

---

**Note**

No 'break' commands will be sent on the serial Ports during a SCS system poweroff cycle. Your servers will not be adversely affected.

---

**poweroff** may be manually run at any time, if required. The **save** command is auto-run as part of the **poweroff** command. Once you have entered the **poweroff** command, the operating system will properly shut down and the SCS will cease operating (almost immediately), and the front panel display will show “OK to Power Off” when it has completed the underlying commands. You may then safely turn the power switch off.

The only way to recover from a **poweroff** command is to turn the system power off and then turn the power back on.

## 6.5 Other Linux Commands

The following Linux commands, among others, will be used with the SCS systems.

### **logout**

Use **logout** to quit your session with the system.

### **man**

Use **man <command name>** to search for a help file (online manual pages) or descriptive information for that Linux / UNIX command.

### **passwd**

The default root password should be changed by the root user, as soon as possible to prevent access by anyone other than authorized personnel. To change the default root password, type **passwd** (all lower case) at the root login prompt.

### **scp**

Use **scp** for **secure copy**, using ssh, between two hosts. The process is encrypted and inherently secure.

Refer to the **man** pages for **scp** for a description and any command options.

## **sftp**

Use **sftp** for a secure file transfer transaction using ssh, between two servers. This process is similar to **ftp** except that it is encrypted for security.

Refer to the **man** pages for **sftp** for a description and any command options.

## **ssh**

The SCS systems use **ssh** to establish secure connections over your network.

The configuration file for ssh is **/etc/ssh/sshd\_config**.

You use **ssh** to establish a secure connection between two hosts, or to transfer files or data between the systems. With the SCS, the Secure Console Server is a client device, and will be connected to an ssh host elsewhere. The security keys for ssh may need to be generated using **ssh-keygen**, depending on your application of ssh.

Refer to the **man** pages for **ssh** for a description and any command options.

## **ssh-keygen**

Use **ssh-keygen** to create keys for users so passwords don't have to be used for ssh login. You can generate the security keys for your client system (in this case, the SCS is the client) to interact with an ssh host elsewhere. After the keys have been generated, the user can establish a secure shell connection using ssh over a network.

Refer to the **man** pages for **ssh** for a description and any command options.

## **stty**

Use **stty** to change the configuration for each Port. The system provides a default configuration for the system Ports (**ttyB1** through **ttyB48**), and for the Console Port (**ttyS0**).

---

### **Note**

Port changes made using **stty** are temporary (not written to memory). In order to keep any changes, you must edit the configuration file in **/etc/rc.d/rc.serial**.

---

The Ports are identified as **/dev/ttyB1** through **/dev/ttyB48** for ports 1 through 48, respectively, and **/dev/ttyS0** for the Console Port.

---

**Note**

For example, to administer Port 7 you would edit the file `rc.serial` and would use `stty -F /dev/ttyB7`.

---

Refer to the man pages for `stty` for a description and any command options.

**versions**

Use `versions` to see a listing of the release versions of the LSI files in the SCS.

## 6.6 Change Logging Level

The sysadmin may wish to change the logging level of syslog.

1. Login as `root`
2. Edit the file `/etc/syslog.conf` (`vi /etc/syslog.conf`)
3. Restart the system logger by entering: `service syslog restart`
4. Run `save`.



*For Your Notes*

---

## 7 System Administration

---

*This section outlines the administration functions and commands, accessed using your Network or the Console port.*

### 7.1 Security

The Logical Solutions Secure Console Servers use ssh to provide encryption for a secure network connection. There is only one level of system administration access in the SCS, and that is at the root level.

---

#### **Caution**

Anyone with the root password has the ability to access all SCS features and functions. Your root password should be carefully guarded.

---

Users do not have the ability to interact with the system-level features. Users that are granted permission to interact with a Port can access the Buffers and may also clear the buffered data.

### 7.2 Change Network Address

You may use the Front Panel setup (see *Section 4.4, Front Panel Network Setup*, beginning on page 33) to configure the SCS's IP address. This will temporarily change the IP address to allow you to connect to the SCS. Front panel changes are temporary in that there is no way to write the new parameters to non-volatile memory using just the front panel keys.

You must run `netconfig` once you have accessed the SCS to change all of the network parameter options, and then save the parameters to non-volatile memory.

## 7.2.1 Run netconfig

After you establish a connection to the SCS using your network, you may want to change the IP address setting of the SCS to the desired address on your network, using `netconfig`.

The `netconfig` script is a self-prompting program to set up your system's network information. It supports DHCP/BOOTP setup, or static addressing.

Use the **space bar** to select / deselect a value (e.g., DHCP). Use the **arrow keys** to move up and down between the entry fields.

---

### Note

Use of a static IP address is recommended with the SCS.

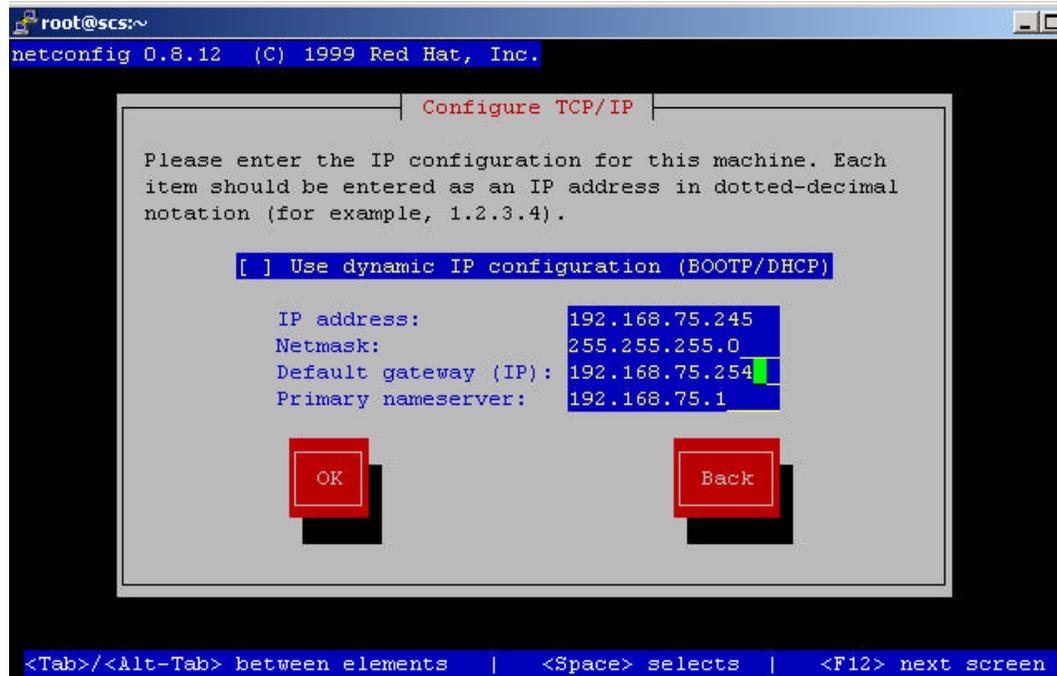
---

You will need the following information before running `netconfig`:

- Using BOOTP/DHCP (yes/no)? If No, you need the following:
- IP Address
- Net Mask
- Default Gateway
- Primary Nameserver

You can add the secondary and tertiary nameservers (if required) by editing your `resolv.conf` file at a later time. After entering the requested information, you are returned to the root prompt.

Figure 7.1 Example of netconfig fill-in fields



When you have filled in the fields, arrow down to the **OK** button and press Enter to accept your entries.

## 7.2.2 More Than One Nameserver

The `netconfig` command allows the user to set up one nameserver's IP address. It is possible to have multiple nameservers, which must be done outside of the `netconfig` routine. The nameserver data is in the file `/etc/resolv.conf`.

If you want to have more than one nameserver, you must edit the file `/etc/resolv.conf`. For more information, refer to the MAN page for `resolv.conf`.

In this file, you will find the IP address you entered with `netconfig`. You can add more lines (maximum of 3 nameservers is allowed) to this file with the address of additional nameservers.

The format of a line is: `nameserver <IP address>`.

---

## 7.3 Change Hostname

The SCS includes a command `changehostname` which allows the root user to change the long hostname of the SCS unit.

1. Log in as root.
2. Type `changehostname`. The current hostname is displayed, and you are prompted to choose `y/n` to proceed.
3. If you select `y` to change, you are prompted to enter the new hostname.

---

### Note

If you make a mistake in your entry, simply continue (do not attempt to edit); you can reject your bad entry and re-enter the value properly.

---

4. Enter your new hostname value. Accept it (`y`) to accept the new value. Remember to run `save` when done to keep your new values.

## 7.4 Time Configuration

Use the command `timeconfig` to set up the date/time and time coordinates. This is a self-prompting utility. Remember to run `save` when done to keep your values.

---

### Note

If changing the Time Zone (during `timeconfig` changes) it is necessary to restart the `lcd` display service in order for the front panel display to update. This is done by using the command `service lcd restart` after completing the `timeconfig` options.

---

## 7.5 Change NIC Speed

You can change the NIC interface configuration from auto-sensing to be fixed, for full or half duplex, and 10Mbit or 100Mbit. The following file information is found in the file `/etc/module.conf`, but with some additional instructions added to as to how to set the NIC speed.

This file already has the various commands in place, but they are commented out. Edit your `/etc/module.conf` as appropriate. Remove the '#' from **one** of the four options lines above, and then reload the NIC driver.

```
alias eth0 eeepro100
alias char-major-72 exser
alias char-major-4 off
options -k exser
##
## options to control NIC speed and mode
## remove the leading '#' from ONE of the options lines below
##
### 100Mbit half-duplex
#options eeepro100 options=0x20
### 100Mbit full-duplex
#options eeepro100 options=0x30
### 10Mbit half-duplex
#options eeepro100 options=0x40
### 10Mbit half-duplex
#options eeepro100 options=0x50
```

The SCS system should be power cycled (using `poweroff`, not `reboot`). The power-off is done to convince whatever switch the NIC is connected to, that it is indeed off.

## 7.6 Configure Authentications

Use `authconfig` to set up the authentication protocols (e.g., `ssh`). Refer to the man page `nscd` for configuration options.

The first checkbox, `cache information`, will start the `nscd` daemon if selected. This is not required for normal operation and need not be selected.

Other aspects of the authentication options in `authconfig` are self-prompting for parameters for NIS, LDAP and/or Hesiod.

Remember to run `save` when done to keep your new values.

## 7.7 Front Panel Display Options

The front panel Display is a two line, 24 character backlit LCD. It shows system messages during certain system events (e.g., network restart, `poweroff`), but most of the time is idle and shows a 'normal' display.

The LCD Display offers several 'normal' display features. The default display shows the Hostname on the top line, and the Date/Time on the lower line. The display can be customized, if desired, to show other information in the top line or the bottom line, or both. This might be useful to provide method of labeling each SCS in a rack with multiple units installed. The normal display can also be turned off.

**Figure 7.2** Default 'Normal' Front Panel Display,

```
scs.localdomainname  
Tue Mar 18 15:53:03 2003
```

The front panel will display system messages (e.g., during reboot or save events) but will return to the 'normal' display after these events are done.

---

**Note**

The Edit Mode can be disabled, and the front panel display's normal display can also be changed.

---

The default setting allows the editing of the IP address information using the front panel buttons. This can be disabled to prevent unauthorized changes.

### 7.7.1 Display Mode Parameters

The various LCD Display modes are controlled by the entries maintained in the `/etc/sysconfig/lsci` directory for the following files:

`LCD_LINE_1=`

`LCD_LINE_2=`

`LCD_DISPLAY_SETTING=`

- `LCD_LINE_1=` and `LCD_LINE_2=` allows text entry of up to 24 characters to be displayed.
- `LCD_DISPLAY_SETTING=` can be set to `EDIT` (default), `VIEW`, or `OFF`.

#### 7.7.1.1 Edit

The Edit mode (`LCD_DISPLAY=EDIT`) allows the front panel display to normally show the current Display information, and allows anyone to use the front panel display to change the network parameters (IP Address, Net Mask, and Gateway).

#### 7.7.1.2 View

The View mode (`LCD_DISPLAY=VIEW`) allows the front panel display to show the current information, but disables the editing using the front panel buttons. This prohibits unauthorized changes to your network settings from the front panel.

### 7.7.1.3 LINE\_1

LINE\_1= info allows the Customer to show any data they choose on the upper line of the display. The root user enters a left-justified text line, up to 24 characters, which will be displayed. The upper line of the display is otherwise the SCS's Hostname.

*Figure 7.3 LINE\_1 Changed in SCS Front Panel Display,*

```
24 characters for Line 1
Tue Mar 18 15:53:03 2003
```

### 7.7.1.4 LINE\_2

LINE\_2= info allows the Customer to show any data they choose on the lower line of the display. The root user enters a left-justified text line, up to 24 characters, which will be displayed. The lower line of the display is normally a clock/date display.

*Figure 7.4 LINE\_2 Changed in SCS Front Panel Display,*

```
scs.localdomain
SCS320 SerNum 1234567890
```

### 7.7.1.5 Display OFF

The Off mode (LCD\_DISPLAY=OFF) disables the front panel LCD display during normal mode. The backlighting will remain on, but the display is blank. The display will still show certain system events to the front panel display.

## 7.8 Network Time Service

Network Time Service is supported. To use the network time service, you must edit two files (/etc/ntp.conf and /etc/ntp/step-tickers) and start the ntpd service.

---

**Note**

More information is available at [www.ntp.org](http://www.ntp.org)

---

## 7.8.1 Configure NTP

The file `/etc/ntp.conf` has many options. We want to define the time servers to use. You need the hostname (or IP address) of the time servers you wish to access. Using your editor, edit the file and add the line:

```
server <my time server name or IP address>  
to the end of the file.
```

For example, let's use the name `ts1.mydomain`. Your entry is  

```
server ts1.mydomain
```

You need the hostname (or IP address) of the time servers you wish to access.

You should also add the server names to the file `/etc/ntp/step-tickers`. This file just needs the name of the time servers (the word 'server' as used in the file `/etc/ntp.conf` is not needed)

## 7.8.2 Start the NTP Service

To start the NTP service manually:

```
service ntpd start
```

To cause NTP to start automatically on startup:

```
chkconfig ntpd on
```

## 7.9 NIS and User Port Permissions

The SCS can use NIS to control user access to the Ports in addition to controlling user access to the SCS itself. This is an extension to the normal NIS capabilities. Some of the NIS files must be installed on your NIS server. The user must create/modify their NIS database to include records containing user port permissions.

---

**Note**

Source documents, including this information, is stored on the hard drive of the SCS system.  
NIS information is located in `/usr/doc/nis`.

---

### 7.9.1 User Port Control

The SCS can use NIS to control which user can access a port on the SCS. To utilize this feature, a database must be created on the NIS server. The following files are needed to set up the port access database:

<code>lsi_port_access</code>	Port Access Permission Definition file
<code>lsi_port_user</code>	Port Access User Definition file
<code>lsi_port_awk</code>	Port Access AWK file (required for the Make file)
<code>makefile.nis.portAccess</code>	Make file used to build the LSI database

### 7.9.2 Changing Serial Port settings

Use `'stty'` to change things like the port name, baud rate, hard/soft flow control. Note that these changes are temporary, and will but lost on the next reboot. To make the changes permanent, the file `/etc/rc.d/rc.serial` must be edited. This file contains a list of stty commands (one for each port).

### 7.9.3 NIS Port Access

The file `lsi_port_access` contains the port permissions for connect, monitor and clear. It is referenced by a group; you may define any number of groups you need. The following example will illustrate how the group file is constructed.

```
group name : console server name : connect perm : monitor perm : clear perm
where:
```

group name	is the name of the user's group
console server name	is the SCS's hostname
connect perm	port that a group can connect with
monitor perm	ports that a group can monitor
clear perm	ports that a group are allowed to clear

For example:

```
pbxgrp : tvscs320 : 1,2-6,13 : 5-9 : 1,7
itgrp : tvscs160 : 8-16 : 7 : 1,3,5,7-11
```

The above example shows two groups (`pbxgrp` and `itgrp`) that are allowed to access port on a secure console server.

The first group, `pbxgrp`, can access an SCS with the hostname of `tvscs320`. The group can connect to ports 1,2,3,4,5,6 and 13. It can monitor ports 5,6,7,8 and 9. This group is allowed to clear ports 1,2,3,4,5,6 and 7.

The second group, `itgrp`, can access the SCS with a hostname of `tvscs160`. This group can connect to ports 8,9,10,11,12,13,14, 15 and 16. It can monitor port 7, and can clear ports 1,3,5,7,8,9,10 and 11.

```
# LSI Port Access Permission file...
# Port Access Permission for the user defined group name(s) are defined below
# Permissions can be any or all of the forms:
# - decimal value
# - decimal range using a dash (-) as the range indicator
# - a comma (,) is used to separate digits and/or ranges
# - a colon (:) is used as the field separator.
#
# group name : console server name : connect perm : monitor perm : clear perm

user_group1 : scs160_milford : 1-16 : 1-3,5,8,16 : 0
user_group2 : scs320_boston : 1-6 : 12,15 : 3-7
```

### 7.9.4 User Names and Groups

The LSI Port User Definition file (`/nis/lsi_port_users`) is used to assign a user to a given Port Access group. This file information is found in `/usr/doc/nis`.

The following example will illustrate how it is set up.

**user name : group name**

*where*

user name    a valid SCS user  
group name   a valid user's group

Example:

**tomv : pbxgrp**  
**billf : itgrp**

The above example shows two users, **tomv** and **billf**. User **tomv** is in the group **pbxgrp** and **billf** is in the group **itgrp**. When user with the `lsi_port_access` file, it illustrates how **tomv** can log into `tvscs320` and be able to connect, monitor and clear the ports that were set up in the previous example. The same goes for **billf**.

```
# LSI Port Access User definition file...
# Port Access user and their respective 'port access group name is defined
# below.
# Users must be valid system usernames.
# Group names are those defined in the "lsi_port_access" file.
#
# user_name : group_name

lsiuser1 : user_group1
lsiuser2 : user_group1
lsiuser3 : user_group2
lsiuser4 : user_group2
```

### Group Permissions

A user may not get access to a port, depending on their group permissions. Only members of the `scsusers` group (group id of 701) may access SCS ports. Only members of the `monitor` group (group id of 702) may access SCS monitor ports.

### 7.9.5 NIS Database file

The `lsi_port_awk` file is used to create the `lsi` database file (`lsiportdbase`) on the NIS server. It contains the `awk` code that the `Make` file needs.

### 7.9.6 NIS Make file

The file `Makefile.nis.portAccess` is used to create the lsi port database.

To build the database, the above files (listed in *Section 7.9, NIS and User Port Permissions*, on page 61) need to be loaded on the NIS server. The system has been tested on a linux machine running RedHat 8.0. The files were placed in the `/var/yp` directory. After the make file executed, the lsi database file was placed in the NIS host directory.

### 7.9.7 NIS Configuration File

The NIS configuration file (located at `/etc/nsswitch.conf`) must be edited by the user to support your NIS server. To do this:

1. Open the file `/etc/nsswitch.conf` using your editor.
2. Edit (add or modify) a line to your config file that supports local files for local users, and if not assigned locally, refers to the NIS database. The line should read:

```
port_access : files nis
```

3. Save your updated `nsswitch.conf` file.

## 7.10 NFS

NFS information can be obtained from the MAN pages. Refer to the following man pages: `nfs`, `mount`, `fstab`.

This section is an overview of setup information for an NFS application, as it pertains to the SCS.

### 7.10.1 Remote NFS Directory

To mount a remote directory onto the SCS, you must start the `portmap` service and the `nfslock` service.

To manually start these services (`portmap` and `nfslock`):

```
service portmap start
service nfslock start
```

You may have these services start automatically at power on. To do so, enter the commands:

```
chkconfig portmap on
chkconfig nfslock on
```

Determine which local directory name you will use to refer to the remote directory. The standard name used is `/mnt`. If you need more than one remote directory

---

mounted, then create the additional directories under the `/mnt` directory (e.g., `/mnt/dir1`, `/mnt/dir2`, `/mnt/dir3...`).

To test the mounting, enter the following:

```
mount -t nfs <remote server name>:<remote directory name>
<local directory name>
```

Example: `mount -t nfs nyc:/usr/local/cvs /mnt/dir2`

---

**Note**

To have this mount happen at startup, you must edit the file `/etc/fstab`. See the man pages above for details.

---

Here is a sample entry:

```
nyc:/usr/local/cvs /mnt/dir2 nfs hard,intr
```

## 7.11 SNMP

SNMP is supported in the SCS. SNMP is 'read only'. Refer to the MAN pages for SNMP for more details.

### 7.11.1 Start SNMP

SNMP is started with the command `service snmpd start`  
`chkconfig snmpd on`

## 7.12 syslog

Using default settings, the SCS will log all warnings and higher events. The SCS keeps a system log file called `/var/log/messages`. The level of logging is controlled by the file `/etc/syslog.conf`.

The SCS products can log the following:

- Notice level events:
  - port settings changed
  - begin and end interactive mode
  - port buffer cleared
- Info level events:
  - user settings modified
  - Port buffer accessed

The default file entry is `*.notice`, with lower level settings (a lower level generates more messages) in `*.info`.

## 7.13 Timeouts

The SCS system supports timeout on the network port. Refer to the man page for `timeout` options.

Use the commands `timeoutd` and `timeouts`.

---

## 8 Administering Users

---

The following commands are used to change settings for Users. You can define as many Users as you wish, up to the memory capacity of the system. The limiting factor when it comes to Users is not the number of users but rather the number of simultaneous sessions invoked by any number of users (250 sessions maximum).

### 8.1 User Setup

Each user account must have a unique name, and each has its own password. Each User account has the following parameters:

Parameter	Constraints
name	A unique user name made up of contiguous characters. Cannot be renamed. This name will be displayed at the command prompt when a user has logged in.
password	Linux password for this user account.
port range or port group (used below)	Default is set to access all ports in the SCS chassis (1-16, 1-32 or 1-48). Ports can be assigned individually (1), in a contiguous range (2-7), in random ports (3,6,9,15) or any combination of the above (1,4-7,12,15-16) of valid port numbers for that chassis.
ESCAPE_SEQ	Escape sequence. Default is "Esc-A". Displayed in ASCII (x1bA)
BREAK_SEQ	Break sequence. Default is "Esc-B". Displayed in ASCII (x1bB)
ALLOW_CLEAR	Range or group of Ports for which this User account can Clear the Port Buffers.
ALLOW_CONNECT	Range or group of Ports to which this User account can connect
ALLOW_MONITOR	Range or group of Ports which the User can monitor

There are three permissions in the user config files:

#### **ALLOW\_CONNECT**

User can enter interactive mode (file name is `/dev/ttyBnnn`). In order to browse a buffer, a user must have connect permissions on that port.

#### **ALLOW\_MONITOR**

A user can watch a port (file name is `/dev/monitor_portnnn`, must be opened in Read-only mode)

#### **ALLOW\_CLEAR**

A user can clear a buffer (file name is `/proc/port_buffers/nnn`)

### **8.1.1 adduser**

SCS Users are identified by a name. The **adduser** command is used to create a new user account. The user's name, password, and port access configurations are set, along with the Escape and Break command keystrokes. After a user has been added, this user can log into the system from a network or console port connection.

### **8.1.2 edituser**

The **edituser** command is used to change the parameters for an existing user. The user name cannot be edited using **edituser**; in order to modify a user's name, you must generate a new user account and enter the appropriate assignments. You should then delete the original user account.

### **8.1.3 deluser**

The **deluser** command is used to delete an existing user account.

---

#### **Note**

The following command modifiers (options) apply to the **adduser** and **edituser** commands.

---

### **8.1.4 Other Editing Commands**

The following commands may be entered to change the following parameters. The root user may change the preset values for these parameters, and a User may also use this command to change the parameter for the Port to which they are connected.

**8.1.4.1 editbrk <name>**

Use `editbrk <name>` to edit the break sequence for a user. The **break** sequence (user key strokes, default is 'ESC - B') is presented in its ASCII form.

**8.1.4.2 editesc <name>**

Use `editesc <name>` to edit the escape sequence for a user. The **escape** sequence (user key strokes, default is 'ESC - A') is presented in its ASCII form.



*For Your Notes*

---

## 9 User Operations

---

*Commands that an End User needs to connect to their Servers through the SCS*

### 9.1 User Accounts

The SCS has two types of user accounts: user, and root.

The SCS supports multiple user accounts, each having a unique combination of read, write and review privileges to each of the Ports. Each defined user may or may not have the ability to interact with any of the attached servers, in any possible combination. Each user account is password protected.

#### 9.1.1 SCS Users

SCS users are individuals that must connect with any or all of the attached networking devices, for service, support or access needs. There can be many users defined, many more than would normally be required. Each user, when connecting to the system, establishes a session with a selected device by entering the **connect** command. There may be up to 250 simultaneous user sessions.

#### 9.1.2 root user

The root user is not like other SCS users. The root user will act as the System Administrator of the SCS and has full access to each of the SCS Ports. There is only one root user for each SCS system.

The root user defines the access rights of all users in the SCS system. The root user's access is secured with the root password (default password is **root**). The root password should be changed and carefully guarded to prevent undesirable access.

## 9.2 Port Identities

Each Port is numbered (1 through 48) and have default names (**port1** through **port48**, respectively) and may also be given a familiar name by the sysadmin. The Users interact with the servers connected to the ports by entering a command associated with either the port number or port name.

## 9.3 What Can A User Do

Summary: use **connect <Port number or name>** to access a specific server or network device.

### 9.3.1 Access via Network

To access a connected server via the SCS network port, the user should use an ssh client to ssh to the IP address of the SCS.

### 9.3.2 ssh to a Port

You can ssh directly to a port by logging in and using the following:  
`ssh user@scs -t -t connect <port number or name>`

### 9.3.3 Access via Console Port

The Console port is normally used by the System Administrator during service events, however it can be used by any user that has access to the terminal and that has a password to log into the system and access system Ports.

### 9.3.4 Interactive Mode

If a user desires to interact directly with an attached server they must enter interactive mode. Use **connect <port name or number>** to connect to a port (only applies to ports for which this user is allowed CONNECT access).

The user's terminal will then be directly connected to the server, and will act as if the terminal was physically connected to the server. The SCS displays the last page of the port buffer along with a system information message indicating which Port is selected as the user enters interactive mode.

When a user attempts to connects to a port that is already in use, they will receive a message **Device or Resource busy**.

To escape from interactive mode, the interactive mode escape sequence must be used. The interactive mode escape sequence is a series of two to ten characters that allow the user to leave interactive mode and return to the system prompt. The default for the interactive mode escape sequence is `<ESC> A` (escape key, then uppercase "A"), but the user may change the sequence by using the command `editesc`.

### 9.3.5 Break Sequence

The user is not directly connected to the server, but rather is connected through the SCS, and therefore cannot use their 'break' key. While a user is connected to a port in the interactive mode, the user can send a break signal to the port by entering a command to cause the Break sequence to occur.

The default value for this sequence is 'ESC - B'.

#### 9.3.5.1 editbrk

When no in the interactive mode, a user can enter `editbrk` to edit or view their preset break sequence. The `break` sequence (user key strokes, default is 'ESC - B') is presented in its ASCII form (x1bB). If the user wishes to keep the existing sequence, they need only to press `<ENTER>` to keep the existing setting.

---

#### Caution

It is generally best to have the sysadmin change the Break sequence, as there may have been an equipment change or other issue that a remote user might not be aware of.

---

### 9.3.6 Escape Sequence

A user-defined sequence of keys is used to leave the interactive mode.

The default value for this sequence is 'ESC - A'.

---

#### Note

It is best to NOT use combinations of the `<CTRL>` key and other keys for the Escape sequence, as these combinations are usually reserved for sending and receiving special characters through a terminal.

---

## 9.3.6.1 Edit Escape Sequence

The User can edit the Escape command sequence, if necessary. The user only change the escape sequence if it causes problems with the hardware or software used.

When logged in, a user can enter `editesc` to edit or view their preset 'Escape' sequence. The `escape` sequence (user key strokes, default is 'ESC - A') is presented in its ASCII form (x1bA). If the user wishes to keep the existing sequence, they need only to press <ENTER> to keep the existing setting.

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### Caution

It is generally best to have the sysadmin change the Escape sequence, as there may have been an equipment change or other issue that a remote user might not be aware of.

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## 10 Regulatory & Safety

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*Regulatory Information and Contact Information*

### 10.1 Safety Requirements

#### 10.1.1 Symbols found on the Product

Markings and labels on the product follow industry-standard conventions. Regulatory markings found on the products comply with requirements.

#### 10.1.2 Product Serial Number

The SCS products have a unique serial number, imprinted on a small silver label that is placed on the bottom of the chassis. The serial number includes a date code. The serial number is also found on the original shipping carton.

#### 10.1.3 Connection to the Product

Connections and installation hardware for the product use industry-standard devices and methods. All wiring connections to the customer equipment is done in a fashion to minimize proprietary or customized connectors or cabling. Power connections are made with regionally appropriate power cords and approved methods. Rack mounting equipment is designed for industry-standard 19-inch rack units.

## 10.2 Regulatory Compliance

The Logical Solutions Inc. SCS products are designed and made in the U.S.A. The SCS products have been tested by a nationally recognized testing laboratory and found to be compliant with the following standards (both domestic USA and many international locations).

### 10.3 North America

These products comply with the following standards:

Safety

- UL60950 : 2000
- CAN/CSA C22.2 No. 60950-00

Electromagnetic Interference

- FCC CFR47, Part 15, Class A
- Industry Canada ICES-003 Issue 2, Revision 1

### 10.4 European Union

#### 10.4.1 Declaration of Conformity

Manufacturer's Name & Address

Logical Solutions Inc.  
100 Washington Street  
Milford, Connecticut 06460 USA  
Telephone (203) 647-8700

Product Name

- Model: SCS160 Secure Console Server, SCS1601 Secure Console Server
- Model: SCS320 Secure Console Server, SCS3201 Secure Console Server
- Model SCS480 Secure Console Server, SCS4801 Secure Console Server

These products comply with the requirements of the Low Voltage Directive 72/23/EEC and the EMC Directive 89/336/EEC.

## 10.4.2 Standards With Which the Products Comply

### Safety

- IEC60950:1992+A1, A2, A3, A4, A11

### Electromagnetic Emissions

- EN55022: 1994 (IEC/CSP1R22: 1993)
- EN61000-3-2/A14: 2000
- EN61000-3-3: 1994

### Electromagnetic Immunity

- EN55024: 1998 Information Technology Equipment-Immunity Characteristics
- EN61000-4-2: 1995 Electro-Static Discharge Test
- EN61000-4-3: 1996 Radiated Immunity Field Test
- EN61000-4-4: 1995 Electrical Fast Transient Test
- EN61000-4-5: 1995 Power Supply Surge Test
- EN61000-4-6: 1996 Conducted Immunity Test
- EN61000-4-8: 1993 Magnetic Field Test
- EN61000-4-11: 1994 Voltage Dips & Interrupts Test

## 10.4.3 Supplementary Information

The following statements may be appropriate for certain geographical regions and might not apply to your location.

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### Note

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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**Note**

This Class A digital apparatus complies with Canadian ICES-003 and has been verified as being compliant within the Class A limits of the FCC Radio Frequency Device Rules (FCC Title 47, Part 15, Subpart B CLASS A), measured to CISPR 22: 1993 limits and methods of measurement of Radio Disturbance Characteristics of Information Technology Equipment.

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This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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**WARNING**

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

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## 10.5 Australia & New Zealand

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

## 10.6 Lithium Battery

The SCS products have a replaceable long-life Lithium battery for support the system BIOS, which will likely never need field replacement. However, if it must be replaced, the following caution statement applies:

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**Caution**

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF UNUSED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

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## 10.7 SCS160R / SCS320R Power Modules

The SCS160R and SCS320R systems have hot-swappable AC Power Modules which can be replaced by a competent technician in the field without interrupting service. Each Module is held in place with a single captive screw.

When servicing the product, it is very important for the user to heed the following Caution:

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### **Caution**

When replacing an AC Power Module in the field, you must first turn its power switch off, then remove its AC Power Cord, **BEFORE** you loosen the screw and pull the module out. When replacing the module, fully insert the module and tighten its screw before replacing its power cord.

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*For Your Notes*

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## 11 How to Contact Logical

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### 11.1 Customer Support

*Thank You* to our Customers for choosing a Logical Solutions product for your application. We appreciate your business and are interested in helping you successfully use our products.

Logical is here to help you. To contact Logical Solutions, use the following telephone numbers and internet-based methods.

If you're not yet a Customer, but are interested in finding a Logical Solution for your application, we'll be glad to help you. Our expert Sales staff will help determine the best solution for your needs, and will help you be certain that you've come to a Logical Solution, too.

Any information we gain about our customers is held in confidence. We do not share customer names or contact information with other companies.

#### 11.1.1 Website

Check out our website for current product offerings, support information, and general information about all of the Logical Solutions we offer.

Our internet website offers product information on all current systems, including technical specification sheets and installation guides (for viewing on-line or for download), product diagrams showing physical connections, and other information you might need. We are constantly updating our website, so be sure to "refresh" your browser when visiting the Logical Solutions website to see the most up-to-date information.

**Internet:** [www.thinklogical.com](http://www.thinklogical.com)

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**Note**

Most online documents are stored as Adobe Acrobat "PDF" files. If you do not have the Adobe Acrobat Reader needed to view PDF files, visit [www.adobe.com](http://www.adobe.com) for this free download.

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## 11.1.2 E-mail

Logical Solutions is staffed Monday through Friday from 8:30AM to 5:30PM, Eastern Time Zone. We will try to respond to your email inquiries promptly, using the following email addresses for your different needs:

**info@thinklogical.com** -- Information on Logical Solutions and our products

**sales@thinklogical.com** -- Sales Department - orders, questions or issues

**support@thinklogical.com** -- Product support, technical issues or questions, product repairs, requests for Return Authorization, any other issue.

## 11.1.3 Telephone

**Telephone Sales:** Contact our expert technically-oriented Sales staff via telephone in Milford, Connecticut, at **(203) 647-8700** or if in the continental US, you may use our toll-free number **(800) 291-3211**. We're here Monday through Friday, 8:30AM to 5:30PM, Eastern Time Zone. Ask for their direct dial phone number when you call!

**Telephone Product Support:** Contact Product Support via telephone in Milford, Connecticut, at (203) 647-8700. The support lines are manned Monday through Friday, 9AM to 5PM, Eastern Time Zone.

**International Sales:** Please contact our US Sales staff in Milford, Connecticut, at **(203) 647-8700**. We're here Monday through Friday, 8:30AM to 5:30PM, Eastern Time Zone (same as New York City). If leaving a voice message, please provide a 'best time to call back' so we may reach you at your convenience.

We have an automated attendant answering our main telephone switchboard 24 hours a day. You can leave voice messages for individuals at any time. Our Sales Representatives have direct numbers to speed up your next call to us.

## 11.1.4 Fax

Our company facsimile number is **(203) 783-9949**. Please indicate the nature of the fax on your cover sheet, and provide return contact information.

## 11.2 Product Support

Logical Solutions Inc.'s support personnel are available Monday through Friday from 8:30AM to 5:30PM, Eastern Time Zone.

If your application might require assistance at some time outside of our normal business hours, please contact us beforehand and we will do our best to make arrangements to help you with your Logical Solutions products.

### 11.2.1 Warranty

Logical Solutions Inc.'s products carry a one year warranty, with longer-term warranties available at time of purchase on most products. Please refer to your product invoice for your product's Warranty Terms and Conditions.

For specific details about the product warranties, please contact Sales.

### 11.2.2 Return Authorization

If, for some reason, you need to return your Logical Solutions product to us, please get a **Return Authorization Number (RA# or RMA#)** from Logical's **Product Support** department before sending the unit in. Return Authorization must include contact information (phone preferred) in the event we have any questions.

After receiving your RA Number, please ship the unit postpaid, with the RA# prominently displayed on the shipping container.

We will contact you about your product once we determine its status.

Products received without Return Authorization and/or Contact information may require additional attention on our part that may delay any desired service or support with your system.

### 11.2.3 Our Address

If you have any issue with the product, have product questions, or need technical assistance with your Logical SCS system, please call us **(203) 647-8700** and let us help.

If shipping something with an RA#, or if you'd like to write us, we are located at:

Logical Solutions Inc.  
100 Washington Street  
Milford, CT 06460 USA



*For Your Notes*

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## Appendix A File System

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### A.1 Read-Only vs. Read-Write

You may choose to interact directly with the SCS's file system, in which case, you must mount it for read-write access before your changes will be saved to the system's Compact Flash memory device. It is not necessary to do this, to use the SCS.

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#### Caution

Regular SCS use does not require changes to Read-Write operation. An experienced sysadmin may only need to use this if they need to interact with the SCS's Linux file system directly. Do not leave the system in read-write mode.

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The SCS's file system is normally mounted in a read-only mode and is run from RAM, to prolong the life (read-write cycles) of the system's Compact Flash memory card. If the system were left in read-write mode, the life span of the SCS can be shortened considerably.

#### A.1.1 Read-Write Mode

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#### Note

It is **VERY IMPORTANT** to remount root as read-only when you are done with any changes (e.g., `mount -o remount, ro /`).

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During system startup, the tar file is expanded into RAM. The root filesystem is then mounted as read-only. It must be remounted read-write in order to make changes (e.g., `mount -o remount, rw /`).



## A.1.2 LSI Directories

The following LSI directories are important for the SCS products:

`/etc`

`/home`

`/var`

`/root`

`/lsi`

The `save` command `tar's` these directories and stores the tar file in `/misc`.

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## Appendix B FAQ

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*A few frequently-asked questions*

### B.1 How do I do this?

This section is a collection of tips and hints for various setup items. The root user can change the following features using the following command steps:

#### B.1.1 Change Port Parameters

Serial Port settings are modified via the `stty` command (see man page `stty`). The serial port settings must be modified in the `rc.serial` file in order to be permanently changed. Note the following:

- Changing port names is persistent over a reboot
- Changing port communication settings (baud rate, parity etc.) is temporary - the file `/etc/rc.serial` must be edited in order to save the settings

To change the Port Parameters, you edit the file:

```
/etc/rc.d/rc.serial
```

For example, to change the baud rate for Port 5 to 19,200 baud, you enter:

```
stty -F /dev/ttyB5 19200 {other options}
```

#### B.1.2 Change the Name of a Port

You can change the name of a Port if you know the original name. For example, to change the Port `<current name>` to “payroll”, you enter:

```
stty --name=payroll -F /lsi/ports/<current name>
```

## B.1.3 View a Buffer

You use `less`, `cat`, etc. to view a port's buffer. There are at least two methods:

```
/lsi/ports/buf_<portname>
```

or

```
/proc/port_buffers/<portnumber>
```

## B.1.4 Control the Output of Debugging Messages

There is an option to control the output of debugging messages. This is a very handy option to have for sysadmins who are integrating NIS port access.

This option allows one method of isolating a problem area during NIS configuration. You may output to `syslog`, but be careful sending to anything else.

`port_access` is called by the driver, and `stdin`, `stdout`, `stderr`, are not open.

See the `--quiet` option. The driver uses the `-q` option.



*For Your Notes*