Ethernet Fast Ethernet

AT-8116

Fast Ethernet Intelligent Switch

U S E R ' S   G U I D E

Allied Telesyn

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Chapter 1
Administrative Interface

The Allied Telesyn International AT-8116 Fast Ethernet switch provides a cost-effective solution for Ethernet and Fast Ethernet connectivity. With 16 dual-speed 10/100 ports, the AT-8116 switch delivers the port density and performance required for a wide range of bandwidth-intensive applications. The autosensing 10/100 ports allow for compatibility with today's network while providing a growth path for the future.

The AT-8116 is a simple-to-use switch that provides versatile configuration options for the network. It can be used to link hubs to maximize performance in existing shared media LANs, aggregate traffic from workgroup switches, and provide dedicated bandwidth for demanding applications such as client/server and multimedia applications.

Features   The AT-8116 has the following major features:

- ❏ 16 dual-speed 10/100 TX ports autosensing
- ❏ Half/Full Duplex selectable on each port
- ❏ 1.6Gbps High Performance Switch
- ❏ Full Wire Speed on All Ports
- ❏ Support for up to 8K MAC addresses
- ❏ Port-based VLANs with support for up to 16 VLANs
- ❏ IEEE 802.1d spanning tree
- ❏ Port Mirroring
- ❏ SNMP Management
- ❏ RMON

The AT-8116 contains a built-in SNMP agent running on the SNMP Processor Board. This allows each unit to be managed from a centralized management station via any SNMP-compliant NMS.

The SNMP agent software complies with the following standards:

❑ RFC 1155 - The Structure of Management Information (SMI) for TCP/IP Based Internets, May 1990

❑ RFC 1212 - The Management Information Base I (MIB I)

❑ RFC 1213 - The Management Information Base II (MIB II), March 1991

❑ RFC 1284 - The Ethernet MIB

❑ RFC 1286 - The Bridge MIB

❑ RFC 1757 - The RMON MIB

❑ The UDP/IP stack implementation conforms to:

— RFC 1122-Requirements for Internet host-communication layers.

— RFC 1123-Requirements for Internet host-applications and support.

The AT-8116 also supports two private MIBs: switch.mib and gswitch.mib.

The SNMP agent utilizes TFTP (RFC 1350), UDP/IP (RFC 768, RFC950, RFC1071 and RFC791) as OSI layers 3 and 4 protocols, ICMP (RFC792) and ARP (RFC826) to complete the UDP/IP protocol suite.

The UDP/IP stack implementation conforms to: RFC 1122-Requirements for Internet hosts - communication layers. RFC 1123-Requirements for Internet hosts - application and support.

Network Management Systems

Network management functions greatly assist in monitoring and controlling your network. The AT-8116 can be monitored and controlled through a generic SNMP-based NMS. The connection to the AT-8116 may be achieved through Ethernet.

The AT-8116 can also be configured and managed through the Command Line Interface. The process is described in detail in the following pages.

Accessing the SNMP Agent

This section describes how to use the console services to configure and manage the AT-8116.

To access the console, connect a terminal to the AT-8116 RS-232 DB-9 connector.

System Requirements

Hardware Requirements

❑ AT-8116 unit

❑ Either a VT100 terminal or a VT100 terminal emulator running on a workstation or PC

❑ RS232 crossover cable with a 9-pin female D-subminiature connector on one end and an appropriate connector on the other end to attach to the VT terminal or VT100 terminal emulator

Software Requirements

If you are using a workstation, use the VT100 terminal emulation software appropriate for your workstation.

If you are using a PC to emulate a VT100 terminal, you can use the following software:

- ❑ In a DOS environment:
    - — MS-DOS 3.30 or later
    - — PROCOMM PLUS for DOS
- ❑ In a Windows 3.1 environment:
    - — Microsoft Windows 3.1 or later
    - — Windows Terminal or PROCOMM PLUS for Windows
- ❑ In Windows 95 or NT
    - — Hyperterminal

─────────────── Note ───────────────
Because of their compatibility and reliability, the software combination listed above are recommended. Other applications may also provide satisfactory results.

VT100 Terminal Settings

Use the following settings when connecting the VT100 terminal or terminal emulator to the AT-8116.

- ❑ Communications Setup
    - — 9600 (baud)
    - — No Parity
    - — 8 Data Bits, 1 Stop Bit
    - — No Local Echo
    - — VT100 Mode
- ❑ Terminate the setup session by pressing Ctrl-C.

For details concerning using the SNMP agent, see Chapter 15, **Using an SNMP Manager**.

Testing the Installation

After you have completed the installation, use the CLI ping command to test for connectivity. See Chapter 15, "**Using an SNMP Manager**".

The ping command sends an echo request to the host specified in the command line. For example, to test connectivity from the switch to a workstation with an IP address of 192.1.1.126, use the following command:

```
SYS_console>ping 192.1.1.126 2

Use CTRL-C or ping-stop to stop the ping
process

SYS_console>192.1.1.126 Alive. echo reply: id
4643, seq 1, echo-data-len 0

191.1.1.126 Alive. echo reply: id 4643, seq 2,
echo-data-len 0

PING process stopped - statistics:

ICMP echo requests: 2

ICMP echo responses: 2

PING process - press <CR> for prompt

SYS_console>
```

Accessing the Command Line Interface Remotely

All commands work exactly as if the serial interface were being used. Five telnet sessions may be active at any given time. This means that after the fifth telnet session is established, all other telnet connections will be refused until one of the current sessions is closed.

Chapter 2
Command Line Interface

This chapter provides instructions for using the AT-8116 CLI.

Features of the Command Line Interface

The CLI provides the following:

❑ Configuration of system parameters, including the console's parameters

❑ Configuration of the switch's SNMP Agent parameters

❑ Configuration of the ports' parameters

❑ Network performance monitoring

❑ Virtual LANs operations

❑ Statistics operations

❑ Spanning Tree operations

Entering Commands

Enter commands by typing the command name followed by zero or more parameters and pressing `<enter>.` For example, typing `<banner>` `<enter>` at the command prompt displays the Administrative Interface logo.

Items typed in courier are to be typed literally, or read directly from the screen.

Angled bracketed items are variables and represent values. For example, `<IPaddress>` represents an IP address in dotted decimal notation as 123.1.2.3.

Items in the Times New Roman font (this font) appearing on a line are hints to the user (not actually displayed on the screen).

Items in { } and separated by | represent alternatives for the argument.

    get-comm {read | write | *}

means you can type one of:

    get-comm read

    get-comm write

    get-comm *

If you enter a command incorrectly, a message is displayed indicating the type of error that occurred. For example, typing a nonexistent command gives the following message:

    SYS_console> pin

    command <pin> not found

If the command exists but the number of parameters is incorrect, the following message is displayed:

    SYS_console> ping

    too few arguments

To get an explanation of the command's parameters add a question mark (?) after the command name:

```
SYS_console> ping ?

?

ping IP traffic generator

[arg #0]  destination IP address

[arg #1]  number of packets to send or 0 for
endless ping

SYS_console> ping
```

―――――――――――――――――――――― Note ――――――――――――――――――――
The command is reprinted after the prompt, and the user has only to add the necessary parameters. If a question mark is added after the first parameter, then the same explanation is provided, and the previous command, including the provided parameters, is redisplayed.

```
SYS_console> ping 129.1.1.7 ?

ping IP traffic generator

[arg #0]  destination IP address

[arg #1]  number of packets to send or 0 for
endless ping

SYS_console> ping 129.1.1.7
```

The CLI provides a history of the last commands. In order to obtain the last command in the the command history, press <!> or Ctrl-P at the prompt .

To correct a command line you may use the following special keys (see the help-kbd command):

❑ `<!> or CTRL-P`- for the previous command

❑ `CTRL-W`- o delete the previous word

❑ `CTRL-U`- to erase the entire line

When, as a result of a command, more than one screen-full of text is to be printed, the user may continue to scroll or stop the process.

```
SYS_console>system
```

System Commands

Table 2-1 System Commands

sys-stat	show system status
get-stst-level	show the selftest level
set-stst-level	change the selftest level
warm-reset	warm reset of the device
cold-reset	cold reset of the device
get-last-err	displays information about the last fatal error
init-nvram	initialize NVRAM to default values
get-sw-file	retrieves the SNMP Agent Software file name
set-sw-file	sets the SNMP Agent Software file name - for download
get-tftp-srvr	retrieves the TFTP download server IP address
set-tftp-srvr	sets the TFTP download server IP address
set-tftp-mode	sets the TFTP download mode
get-tftp-mode	retrieves the TFTP download mode
sw-dnld	software download BY TFTP
set-fg-param	sets the Ethernet frame generator parameters
start-fg	starts the Ethernet frame generator
stop-fg	stop the Ethernet frame generator

Finally, the user may press <?> to see the list of commands which start with the text he has already typed, eg: User pressed <?>

```
SYS_console>get-c?
```

```
?
```

```
command 'get-c' not found
```

SYS_console>get-co?

Table 2-2 Commands Matching <get-c>

get-comm	show current read or/and write community
get-con-matrix	retrieves the VLAN connectivity matrix
get-colls-cnt	gets the collision distribution counters per port

Command Line Interface Structure

The CLI has several categories of commands:

❑ Console related commands: help, banner, console parameters setup, etc.

❑ System related commands: reset commands, download commands, initialize the NVRAM with defaults, etc.

❑ IP commands: parameter setup, parameter and information display, etc.

❑ SNMP agent related commands: parameter setup, management and traps options

❑ Switching Database related commands: aging time management and Switching Database entry management

❑ Virtual LAN commands

❑ Port Configuration related commands

❑ Switching statistics commands

❑ Spanning Tree related commands

See the quick reference at the end of this chapter for a command list separated by subject.

Typing ? at the CLI prompt displays a list of all the available command topics and a short explanation about each. Typing in one of the names on this list will yield a list of the commands under that topic.

```
SYS_console>?
```

Table 2-3 Commands Groups

console	Console related commands
system	System related commands
ip	IP related commands
snmp	SNMP related commands
switch-db	Switching Database related commands
vlan	Virtual LANs related commands
port-cfg	Port Configuration related commands
statistics	Switching Statistics related commands
sp-tree	Spanning Tree related commands

Chapter 3
Console Commands

The console commands contain a set of commands which allow the user to configure the CLI parameters and user interface. To view the console commands, type `<console>`.

```
help-kbd
```

This command lists the console function keys.

```
SYS_console>help-kbd
```

```
SYS_console>
```

Table 3-1 Console Function Keys

^U (or Escape)	clear the line
^W	clear the previous word
! or ^p	for previous command
TAB	for command completion
?	help, depending on position: in parameters - list of the parameters in 1st column - list of the categories
#	with line number - repeat command from history, for example: #26 without line number - show history list

banner

The banner command will display the CentreCOM 8116 Allied Telesyn International logo.

clear

The clear command will clear the screen and display the prompt.

login

The login command will exit the Administrative Interface, but will not disconnect a Telnet session. This allows the user to test a password (or other activity) without reconnecting.

logout

The logout command will end the actual Administrative Interface Session. Any further access will request the user to login again.

set-page

This command sets the console page: page size in lines 5...127 or 0 for no paging.

set-prompt

```
set-prompt <new_prompt>
```

The set-prompt command allows the user to set a new command line prompt for the Administrative Interface. With the prompt command, you can set a more meaningful prompt, such as a location of the switch, or the name of a workgroup. The default prompt is SYS_console> .

```
SYS_console> set-prompt R&D_grp>

R&D_grp> _
```

set-attr-prompt

This command sets the prompt attributes.

```
SYS_console>set-attr-prompt <number of
option>

[arg #0] options: 0-normal,1-bold,2-
underline,4-blink,8-reverse

SYS_console>
```

set-attr-msg

This command sets the display message attributes.

```
SYS_console>set-attr-msg <number of option>

[arg #0] options: 0-normal,1-bold,2-
underline,4-blink,8-reverse

SYS_console>
```

set-attr-text

This command sets the text display attributes.

```
SYS_console>set-attr-text <number of option>

[arg #0] options: 0-normal,1-bold,2-
underline,4-blink,8-reverse

SYS_console>
```

set-passwd

A password is not required to access the system software. However, a username is required to log in to the system. A user simply enters his/her username when the username prompt appears and if you do not wish to set a password at this time, you only need to press the <enter> or <return> key twice to access the system's software.

The **set-passwd** command allows a user to set a password or to change the original one, if previously installed. The system first prompts the user for the original (old) password. Then the system prompts you for a new password. Then, type the same password again for verification. At no time are any of the passwords echoed back to the user.

If the user enters the old password incorrectly or fails to verify the new password correctly, the password will not be changed.

```
SYS_console>set-passwd

SYS_console>

   Enter old password:

      Enter new password:

      Enter new password again:

      Error : different new passwords
```

If the password change succeeds, the system will respond accordingly.

```
SYS_console>set-passwd

SYS_console>

   Enter old password:

      Enter new password:

      Enter new password again:

CLI running password changed

CLI password change in the NVRAM OK
```

Chapter 4
System Commands

The System Commands allow the user to display and set the system-related parameters. Type <system> to display system related commands.

sys-stat

The sys-stat command displays general status information about the Ethernet Switch and its SNMP Agent Hardware and Software:

```
SYS_console>sys-stat

CentreCOM 8116
SNMP Agent Software - Version 2.01 Mon Aug 18
12:34:35 1997
SNMP Object ID is: <  1.3.6.1.4.1.207.1.4.14
System MAC Address: 00-00-F4-7A-43-40
Switching Data Base Size: 8192 entries
Total uptime(hundredths of seconds): 12145
Total uptime(days, hh:mm:ss format): 0 days,
0:02:01.45
```

```
i/f  1 -- description [Port  1 - 10/100BaseTxETHERNET Port] -- status [UP]

i/f  2 -- description [Port  2 - 10/100BaseTxETHERNET Port] -- status [UP]

i/f  3 -- description [Port  3 - 10/100BaseTxETHERNET Port] -- status [UP]

i/f  4 -- description [Port  4 - 10/100BaseTxETHERNET Port] -- status [UP]

i/f  5 -- description [Port  5 - 10/100BaseTxETHERNET Port] -- status [UP]

i/f  6 -- description [Port  6 - 10/100BaseTxETHERNET Port] -- status [UP]

i/f  7 -- description [Port  7 - 10/100BaseTxETHERNET Port] -- status [UP]

i/f  8 -- description [Port  8 - 10/100BaseTxETHERNET Port] -- status [UP]

i/f  9 -- description [Port  9 - 10/100BaseTxETHERNET Port] -- status [UP]

i/f 10 -- description [Port 10 - 10/100BaseTxETHERNET Port] -- status [UP]

i/f 11 -- description [Port 11 - 10/100BaseTxETHERNET Port] -- status [UP]

i/f 12 -- description [Port 12 - 10/100BaseTxETHERNET Port] -- status [UP]

i/f 14 -- description [Port 14 - 10/100BaseTxETHERNET Port] -- status [UP]

i/f 15 -- description [Port 15 - 10/100BaseTxETHERNET Port] -- status [UP]

i/f 16 -- description [Port 16 - 10/100BaseTxETHERNET Port] -- status [UP]
```

SYS_console>

The screen displays the following information:

❏ The device name and type

❏ The SNMP Agent Software version and release date

❏ The device SNMP Object ID

❏ The device MAC Address

❏ The Switching Database size

❏ The system uptime in 1/100 sec as well as in days, hours, minutes, seconds

❏ The interfaces description and status

get-stst-level

This command shows the self-test level (Disable or Enable) of the device.

Default Value: Enable

set-stst-level <level>

This command sets the self-test level of the device. There are two levels of self-test: Disable and Enable. The self-test level is stored in Non-volatile Random Access Memory (NVRAM).

warm-reset

The warm-reset command resets the SNMP Agent software. The Switch configuration is changed according to the values stored in the NVRAM. This command will permit the user to refresh the Switch configuration after a change of the NVRAM parameters. The statistics counters are also reset by the warm-reset command.

cold-reset

This command causes the switch to cold-reset. Cold reset is equivalent to power on the switch.

get-last-err

This command retrieves the most recent system failure for diagnostic purposes.

```
SYS_console>get-last-err

System information since the last hardware
reset

----------------------------------------------

Software resets number: 0

The system never encountered a fatal error

SYS_console>
```

─────────────── **Note** ───────────────
Software resets number implies executed "warm resets" commands after last "cold reset".

`init-nvram`

This command resets the non-volatile RAM (NVRAM) on the SNMP Agent to default values. Change will take effect after boot (warm or cold reset).

`get-sw-file`

This command retrieves the SNMP Agent Software file name.

`set-sw-file`

```
set-sw-file <filename>
```

Sets the name of the file downloaded by TFTP. This name must match the name of the agent software file on the TFTP server.

`get-tftp-srvr`

This command retrieves the IP address of the TFTP server which the Agent will use to download software (see sw-dnld).

`set-tftp-srvr`

```
set-tftp-srvr < IP address>
```

Sets the IP address of the TFTP server used for downloading.

`set-tftp-mode`

This command sets the TFTP download mode.

```
SYS_console> set-tftp-mode {client|server}

Switch Tftp client/server is enabled for next
download.
```

Refer to Appendix A, Software Downloading for more details.

`get-tftp-mode`

This command retrieves the TFTP download mode and requires no argument.

sw-dnld

This command begins the software download process from the remote TFTP server specified by the set-tftp-srvr command, retrieving the file specified by the set-sw-file command.

set-fg-param

set-fg-param   sets the Ethernet frame generator parameters

[arg #0] destination address in hex format xx-xx-xx-xx-xx-xx

[arg #1] source   address in hex format xx-xx-xx-xx-xx-xx

[arg #2] frame fill pattern - hex byte

[arg #3] frame length - including DA, SA and type/length

This command sets the frame generator parameters. dest and source are dash-separated hardware addresses in hex. fill_byte is a single byte used to fill the entire packet except for the first 12 bytes. length is the total length of the packet excluding CRC.

```
SYS_console>set-fg-param 00-0E-DE-02-80-01
00-0D-01-32-11-22 aa 100
```

SYS_telnet>

SYS_telnet>start-fg?

?

start-fg

start-fg   starts the Ethernet frame generator

[arg #0] destination ports - ports list in decimal format: d-d-d-..-d

[arg #1] number of frames to be generated - 0=forever

[arg #2] frame per second

SYS_telnet>

This command starts frame generation. dport is a dash-separated list of ports on which to generate traffic. For example, a dport of 2-3-4-5-6 will send frames to ports 2,3,4,5,6. count specifies the number of frames to send on each interface. A count of 0 specifies an infinite number of packets. rate specifies the number of packets per second to generate.

stop-fg

This command stops the Ethernet frame generator.

Chapter 5
IP Commands

This section lists the IP Configuration commands available to the command line interface. It is separated into different sections to allow simpler lookup: IP Configuration lists general configuration commands, Ping lists commands pertaining to the ping ability of the Agent, Address Resolution Protocol lists ARP-related information.

get-ip

This command shows the device's current IP address, if any.

If the IP Config has already been defined

```
SYS_console>get-ip

--IP Config already defined
```

The device IP address is: 194.090.136.187.

If the device has no IP Address defined.

```
SYS_console> _

SYS_console>get-ip

-- No IP Config defined

SYS_console>
```

set-ip

```
set-ip<IPaddress>
```

Sets the IP address of the SNMP Agent. If no IP address was previously set (as is the default factory configuration), the new value will be used immediately and saved into NVRAM. Otherwise the new value will only be stored in the NVRAM, and the user must execute a "warm-reset" to effect the change.

`get-ip-cfg`

This shows the complete current IP configuration - address, network mask and broadcast address.

```
    -- If an address has been previously defined:

    SYS_console> get-ip-cfg
```

The device IP address, netmask and broadcast are:

> IP address : 149.035.200.032

> IP netmask : 255.255.255.000

> IP broadcast : 149.035.200.255

```
    -- If no address is defined:

    SYS_console> get-ip-cfg
```

The device has no IP Address defined.

```
    SYS_console>
```

`set-ip-cfg`

`set-ip-cfg <IPaddress> <netmask> <broadcast>`

Sets IP address, network IP address and broadcast IP address. If no IP configuration was previously set (as is the default factory configuration), the new values will be used immediately and saved into NVRAM. If a previous IP configuration was being used, the new configuration will be saved in NVRAM for the next session. In order to use the newly defined values immediately, reset the system using the "warm-reset" command.

─────────────── **Note** ───────────────
If the IP configuration is not specified, the agent will not respond to any in-band requests, including ping messages.

```
        -- If no IP Config. is defined:
```

```
SYS_console>set-ip-cfg 194.90.136.187 255
255.255.0 255.255.255.255

Device IP Address set for this session

Device IP Address change in the NVRAM OK

The device NVRAM IP configuration will be:

       IP address   : 194.090.136.187

       IP netmask   : 255.255.255.000

       IP broadcast : 255.255.255.255
```

SYS_console>

-- IP Config. is already defined.

SYS_console>set-ip-cfg 194.90.136.187 255.255.255.0
255.255.255.255

Device IP address unchanged for this session
Device IP Address change in the NVRAM OK

The device NVRAM IP configuration will be:

   IP address : 194.090.136.187

   IP netmask : 255.255.255.000

   IP broadcast : 255.255.255.255

SYS_console>

Perform a warm-reset to immediately use the newly defined parameters.

clear-ip-cfg

This command clears the IP configuration in the NVRAM.

```
SYS_console>clear-ip-cfg
```

Device IP Configuration change in the NVRAM cleared OK.

get-gatew

Shows default gateway. This command shows which default route will be used to access a different IP network.

```
SYS_console>get-gatew

The default gateway address is:
194.090.136.254

SYS_console>
```

set-gatew

Sets the default gateway IP Address. This command lets you specify the address of the router used to access a different IP for network management packets or Ping. However, if not set, then all packets remain in the local network. The default value for the default gateway IP address is 0.0.0.0.

```
set-gatew <IPaddress>

SYS_console>set-gatew 194.90.136.254

Device Default Gateway change in the NVRAM OK

Device Default Gateway changed to:
194.90.136.254

SYS_console>
```

Chapter 6
Address Resolution Commands

`get-arp-tbl`

Shows ARP table. The Address Resolution Protocol (ARP) table contains information that shows the maping of IP addresses to MAC addresses and interface numbers.

```
SYS_console>get-arp-tbl

IfIndex    IpAddress          MAC Address


===============================================

8          194.090.136.126    00-20-AF-C9-EB-23

SYS_console>
```

`del-arp-entry`

```
SYS_console>del-arp-entry {<IPaddress>|*}
```

Deletes entries from the ARP table. If an IP address is specified, the matching arp entry will be deleted. If * is specified, the entire ARP table will be flushed. This command should be used if the network topology has physically changed, e.g. if a management station has been moved from one segment to another, thus changing its interface number.

add-arp-entry

Add entry to ARP table.

```
add-arp-entry <IPaddress> <mac_address>
<Interface> (Port MAC address resides on.)

SYS_console>add-arp-entry 194.90.136.133 00-
11-22-33-44-55 1

ARP Table Entry succesfully added

SYS_console>get-arp-tbl

IfIndex   IpAddress          MAC Address

===============================================

1         194.090.136.133    00-11-22-33-44-55

8         194.090.136.126    00-20-AF-C9-EB-23

SYS_console>
```

Chapter 7
Ping Commands

Ping

Performing a ping allows you to send packets to another managed network device to see if the device responds.

Ping <IP address><destination address><# packets to send or 0 for endless pings>

ping-stop

Stops the active ping process.

SYS_console>**ping 194.90.136.23 4**

Use CTRL-C or ping-stop to stop the ping process

SYS_console> PING process stopped-statistics:

   ICMP echo requests   : 4

   ICMP echo responses : 0

   PING process - press <CR> for prompt

If the host does not respond, only statistics are printed. Failure to get an echo response from a host may be due to:

- ❑ A bad physical connection

- ❑ A non-existent or inactive host

- ❑ Network Unreachable: no corresponding entry in the routing table

- ❑ Destination Unreachable: the default gateway failed to route the datagram

- ❑ Outdated ARP table information - flush the ARP table with the del-arp-entry command

If there is an active ping process due to a previous "long" ping command and you try to start a new ping, the command fails and an error message is displayed.

For example, start an endless ping to an unreachable host. No response will be received. Now try to ping an existing host. The second ping will fail because the first one is still active. The solution is to use the ping-stop command to stop the first active ping process.

```
     -- host 194.90.136.23 0 unreachable

SYS_console>ping 194.90.136.23 0

Use CTRL-C or ping-stop to stop the ping
process

SYS_console>ping 194.90.136.20 1

A ping process is active - can't start another
one

SYS_console>ping-stop

PING process stopped - statistics :

   ICMP echo requests    :          35

   ICMP echo responses   :           0

PING process - press <CR> for prompt

SYS_console>

SYS_console>ping 194.90.136.20 1
```

Use CTRL-C or ping-stop to stop the ping process

SYS_console>194.90.136.20 Alive. echo reply: id 4643, seq 1, echo-data-len 0

PING process stopped - statistics :

   ICMP echo requests   :   1

   ICMP echo responses :   1

PING process - press <CR> for prompt

ping-stop

Stop the active ping process.

Chapter 8
SNMP Commands

This chapter contains a description of the commands available under the CLI to set and display the SNMP Agent IP and SNMP parameters and databases. Type <SNMP> to view SNMP related commands.

SNMP Community String Commands

SNMP Community strings authenticate access to the MIB (Management Information Base). Community strings function as "passwords" embedded in every SNMP packet. The community string must match one of the two community strings configured in the switch for the message to be processed. There are two community strings, one for each of the following types of accesses:

❑ read - mode gives read access to all the objects in the MIB, but does not allow write access

❑ write - mode gives read and write access to all objects in the MIB

get-comm

```
get-comm {read|write|*}
```

This command displays the SNMP community string for a given access mode (read or write). If the access mode is specified as *, both the read and the write community strings are displayed.

```
SYS_console>get-comm *

Current read  community is: < public >

Current write community is: < private >
```

set-comm

```
set-comm {read|write} <community-string>
```

This command lets you specify the SNMP community string for each of the two access modes: read and write.

```
SYS_console>set-comm write password

New write community is: < password >

SYS_console>
```

SNMP Trap Message Commands

When the Switch detects an extraordinary event, it generates a trap. A trap is a notification message that may be sent to predefined Network Manager Stations. A trap event may be a reset (cold or warm), detection of an interface link status change, an SNMP authentication failure due to an incorrect community string, etc.

The SNMP trap commands let you manage:

❑ Whether or not the device issues an authentication trap

❑ The list of selected SNMP Manager Stations to which the switch-generated traps will be sent by the SNMP agent. The list has a maximum capacity of five entries.

get-auth

Displays the Authentication Trap mode: enabled or disabled.

set-auth

```
set-auth {enable|disable}
```

This command allows the user to modify the Authentication Trap mode. The default value is enable, meaning that the switch will generate authentication traps. Changing the mode to disable will prevent the switch from sending authentication traps.

get-traps

Displays the list of traps-receiving stations: their IP address and trap SNMP community string.

```
SYS_console>get-traps

              SNMP TRAP TABLE

              ===============

   IPADDR                      COMMUNITY

  -----------------------------------------

   194.090.136.126 ----------- public

  -----------------------------------------

SYS_console>
```

add-trap

The add-trap command enters the IP Address of the SNMP Manager station and the trap community string that will appear in the trap message.

```
add-trap <IPaddress> <trap-community>

SYS_console>add-trap 194.90.136.20 rnd

Entry 194.90.136.20 - rnd added

              SNMP TRAP TABLE

              ===============

   IPADDR                      COMMUNITY

  -----------------------------------------

   194.090.136.126 ----------- public

   194.090.136.020 ----------- rnd

  -----------------------------------------

SYS_console>
```

del-trap

The del-trap command can be used to remove an SNMP station from the trap table. The station IP address must be provided.

```
del-trap <IPaddress>

SYS_console>del-trap 194.90.136.20

Entry 194.90.136.20 - rnd deleted

SYS_console>
```

get-rmon-state

This command displays RMON's limits and bounds.

```
SYS_console>get-rmon-state

RMON current configuration

==============================

MaxTimeForRowCreation = 600

MaxHistCtlRows        = 20

MaxBucketsPerControl  = 500

MaxBucketsTotal       = 2000

AlarmMinInterval      = 1

AlarmMaxInterval      = 3600

MaxAlarmRows          = 50

MaxLogEntriesPerEvent = 15

MaxEventRows          = 10

==============================

SYS_console>
```

Chapter 9
Switching Database Commands

This section contains instructions for managing the Switching Database with the Administrative Interface. Type `<switch-db>` to view related commands.

The Switching Database consists of 8192 entries. Each active entry contains the information relevant to a workstation, characterized by its Ethernet MAC Address. Each entry contains the following information:

❑ Entry

Signifies the index in the Switching Database Table.

❑ LOCK

If on (denoted as a +), the entry will not be deleted by the switch aging process (static entry). If off (denoted as a -), this is a dynamic entry that may be automatically deleted by the switch aging process if a packet with this source MAC address is not received during an aging time period.

❑ MGMT (not user configurable)

If on (denoted as a +), the entry is a system address. Such addresses are the switch's individual and group addresses, as well as other addresses added by the management system. If off (denoted as a -), the entry contains the MAC address of a station on the connected network.

❑ DPORT

The destination port to which frames with the stated address will be forwarded.

❑ MAC Address contained in an entry or given as a parameter is printed as a 6 byte, hexadecimal sequence, separated by the "-" sign, e.g.

00-20-1A-00-01-29

The following section lists commands relevant to the Learning Table and Aging mechanism of the switch. The <index> contained in the following commands is an integer number between 1 and the maximum size of the Switching Database Table (8192).

Learning Table

get-lt-entry

SYS_telnet>**get-lt-entry 26**

Entry ---- MAC Address ---- LOCK   DPORT   MGMT

==

26   00-00-F4-7A-43-49   -   16   -

SYS_telnet>

The entry described is:

❑ Entry number 26

❑ MAC Address 00-00-F4-A2-4D

❑ Is not a static entry, i.e. it will be aged out (lock is off)

❑ The address was learned on port 16

❑ Is not a system address (mgmt is off)

`get-lt-16`

Displays 16 learn table entries starting at <index>, or " * " to continue from the last displayed index. The format of the display is similar to the previous command format. If the end of the learn table is reached, the * parameter will start the list over from the beginning.

SYS_telnet>**get-lt-16 15**

Entry	---- MAC Address ----	LOCK	DPORT	MGMT
15	00-00-F4-7A-43-4E	+	-NONE-	+
16	00-00-F4-7A-43-4F	+	-NONE-	+
17	00-A0-C9-03-00-4F	-	16	-
18	00-60-E8-FF-FF-FF	-	16	-
19	00-00-A2-62-15-BB	-	16	-
20	00-60-E8-08-03-11	-	16	-
21	00-60-E8-11-22-65	-	16	-
22	00-A0-D2-C1-55-B1	-	16	-
23	08-00-20-81-A4-70	-	16	-
24	00-00-F4-A4-14-E6	-	16	-
26	00-00-F4-A2-4B-48	-	16	-

******* End of Learn Table ************

SYS_telnet>

The first 16 displayed entries belong to the system. These entries contain important information related to the SNMP Agent and should never be modified or removed by the user. These entries are denoted by a (+) in the LOCK and MGMT columns.

The displayed entries in the get-lt-16 table denoted by a (-) in the Lock and MGMT columns are self-learned MAC addresses, as indicated by a (-) in the LOCK and MGMT columns. These entries were each learned from the port stated in the DPORT field.

`find-lt-addr`

SYS_telnet>**find-lt-addr 0060e8112265**

Entry ---- MAC Address ---- LOCK   DPORT   MGMT

```
=======================================================
21        00-60-E8-11-22-65   -          16          -
```

SYS_telnet>

The switch as factory-configured, has default a VBC and a SVLAN VLAN that contain all 16 ports. Ports in the default VLAN's are deleted when they are assigned to a designated VLAN. By the use of the "get-vbc-tbl" or "get-svlan-tbl" command, you can discover the ports that are in the default VLAN's.

Example 1:

SYS_telnet>get-svlan-tbl run

RUNTIME   SECURITY VIRTUAL LANs TABLE

```
==============================================
          0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1
SVLAN -   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
1 :       - - - - - - - - - - + + + + + + + +
```

SYS_telnet>

This example shows that the current DEFAULT SVLAN ports, which are represented by hypens, are ports 1,2,3,4,5,6,7, and 8 as denoted by the (-) in the SVLAN table.

Example 2:

SYS_telnet>**get-svlan-tbl run**

RUNTIME Security Virtual LANs Table is empty

SYS_telnet>

This example shows that all the ports are in the DEFAULT SVLAN, since NONE are assigned to a designated VLAN

Example 3:

SYS_telnet>**get-vbc-tbl run**

RUNTIME   VIRTUAL BROADCAST DOMAIN TABLE

```
=============================================
          0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1
VBC -     1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
1 :       - - - - - - - - + + + + + + + +
```

SYS_telnet>

This example shows that the current DEFAULT VBC ports are 1, 2, 3, 4, 5, 6, 7, and 8, As denoted by the (-) in the VBC table.

Example 4:

SYS_telnet>get-vbc-tbl run

RUNTIME   Virtual Broadcast Domain Table is empty

SYS_telnet>

This example shows that all the ports are in the DEFAULT VBC, since NONE are assigned to a designated VBC. The `get-vbc-tbl run` command searches for the address in the learning table.

```
    SYS_console>find-lt-addr 01-02-03-04-05-06

    MAC Address - 01-02-03-04-05-06 - not in LT
```

`del-lt-entry`

```
    del-lt-entry <index>
```

Deletes the learn table entry at <index>. If the entry delete was successful or if the entry is not ACTIVE, then the command will be successful.

Deleting entries with the MGMT field set (+) is prohibited since they are system addresses.

The del-lt-entry command is very powerful, allowing the user to change the entire Switching Database with the exception of the System MAC Addresses. Therefore, it should be used with caution.

```
SYS_console>del-lt-entry 25

    Deleting entry at index - 25 -  OK

SYS_console>del-lt-entry 1

    Cannot delete a System Address
```

del-lt-addr

Deletes the learn table entry that matches the MAC address.

The command fails if **mac_address** is not found in the learn table. Again, as in the previous command, caution should be employed when deleting system entries : (+) in MGMT column.

```
del-lt-addr <mac_address>

SYS_console>del-lt-addr 00-11-22-33-44-55

MAC Address - 00-11-22-33-44-55 - not in LT

SYS_console>
```

add-lt-entry

Add a learn entry to the Switching Database. The commands parameters are described at the beginning of this chapter.

```
add-lt-entry <mac_address> <dport>
```

───────────── Note ─────────────
DPORT is a decimal number representing the ID of the port.

get-lt-age

```
The running aging time is: 300 seconds.
```

Displays the Switching Database Aging Time in seconds. The Aging Time is the time-out period for aging out dynamically learned forwarding information entries. An entry whose MAC address does not appear in the source field of an incoming packet for a period equal to the Aging Time is discarded.

```
get-lt-age
```

set-lt-age

```
set-lt-age {run|nvram|all} <aging_time>
```

Aging _time is between 10 and 11000 seconds or 0 for aging off.

Example:

```
SYS_console>set-lt-age all 300
```

Aging Period update in NVRAM OK
Aging Period update in the running database OK

```
SYS_console>
```

Lets the user modify the Switching Database Aging Time. The change may be made:

❑ In the running database so that the new value is used immediately

❑ In the NVRAM, meaning that the change will occur only in the next session after the switch is reset

❑ In both the running and the NVRAM databases

Chapter 10
Virtual LAN Commands

Virtual LANs can be used to limit the broadcast domain and to establish secure virtual workgroups. The following parameters are used within the VLAN commands.

- ❑ run indicates that only the currently running configuration is changed. Changes are not restored after a reset.

- ❑ NVRAM indicates that only the configuration stored in non-volatile memory is changed. Changes will not take effect until a warm or cold reset.

- ❑ all indicates that both the currently running configuration and the non-volatile configuration is changed. Changes will take effect immediately and will be restored after a reset.

```
Type <vlan> to view the related commands.

SYS_console>vlan
```

get-con	matrix retrieves the VLAN connectivity matrix
set-vbc	domain defines a Virtual Broadcast Domain
del-vbc	domain deletes a Virtual Broadcast Domain
get-vbc-tbl	displays the Virtual Broadcast Domain Table
get-vbc	matrix retrieves the VBC connectivity matrix
set-sec-vlan	defines a Security Virtual LAN
del-sec-vlan	deletes a Security Virtual LAN
get-svlan-tbl	displays the Security Virtual LAN Table
get-svlan-matrix	matrix retrieves the Security VLANs connectivity matrix

set-mon-port	sets the monitoring port
stop-mon	stops port monitoring
monitor	starts port monitoring
get-nv-mon	retrieves the NVRAM based monitoring configuration
save-mon	saves the running monitoring configuration to NVRAM
clear-nv-mon	clears the NVRAM based monitoring configuration

Virtual Broadcast Domains (VBC)

Virtual Broadcast Domains are port-oriented VLANs that allow broadcast Ethernet addresses to be broadcasted (transmitted) to the assigned ports in that VBC. The VBCs do not require a SVLAN to be configured to allow packet switching between assigned ports in a VBC. Broadcast packets (destination address of FF FF FF FF FF FF) remain within the VBC where they are received and are transmitted to only the ports in a SVLAN that are members of the receiving VBC port.

A VBC VLAN can be built from any combination of ports. However, ports in a VLAN cannot overlap. If you assign the same port to multiple VLANs, they become one VLAN which contains all of the original VLAN ports. You can view VLAN settings by using the CLI "get-con-matrix" command which shows the connectivity matrix of all the ports (identifies the ports sending frames to other ports).

get-con-matrix

Retrieves the current connectivity matrix for the switch. The first column is the source port. The other columns are destinations to which frames from a given source port (determined by which row) may be forwarded. Unlearned addresses will be forwarded to all destinations marked with a + in the source port's row. Learned addresses will be forwarded to their destinations only if the destination is marked with a "+" in the source port's row. Note that the switch has a default VBC that contains all the ports in the switch that are not assigned to a VBC VLAN. The following example shows that Ports 1-4 are in VLAN #1; the remaining ports are in the default VLAN. Also see the example for get-vbc-tbl run.

SYS_console>get-con-matrix

VBC CONNECTIVITY MATRIX

==========================

```
            0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1

SRC to :    1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6

1 :         - + + + - - - - - - - - - - - -

2 :         + - + + - - - - - - - - - - - -

3 :         + + - + - - - - - - - - - - - -

4 :         + + + - - - - - - - - - - - - -

5 :         - - - - - + + + + + + + + + + +

6 :         - - - - + - + + + + + + + + + +

7 :         - - - - + + - + + + + + + + + +

8 :         - - - - + + + - + + + + + + + +

9 :         - - - - + + + + - + + + + + + +

10 :        - - - - + + + + + - + + + + + +

11 :        - - - - + + + + + + - + + + + +

12 :        - - - - + + + + + + + - + + + +

13 :        - - - - + + + + + + + + - + + +

14 :        - - - - + + + + + + + + + - + +

15 :        - - - - + + + + + + + + + + - +

16 :        - - - - + + + + + + + + + + + -

SYS_console>
```

`set-vbc-domain`

`set-vbc-domain {run|nvram|all} <port_list>`

This command establishes a Virtual broadcast domain. port_list is a dash-separated list of ports to group into a broadcast domain. For example:

`set-vbc-domain all 2-5-6-7`

Creates a virtual broadcast domain of ports 2, 5, 6, and 7.

`del-vbc-domain`

`del-vbc-domain {run|nvram} <domain_id>`

This command deletes a virtual broadcast domain. domain_id is the vbc id number as identified by get-vbc-tbl.

─────────────────── Note ───────────────────
When you use the set-vbc-domain command with the all parameter, both the runtime and nvram databases are changed. In case you need to delete the mentioned vbc entries, you should run the del-vbc-domain command twice with run and nvram parameters.
──

get-vbc-tbl

`get-vbc-tbl {run|nvram}`

This command retrieves the list of defined virtual broadcast domains.

```
SYS_console>get-vbc-tbl run

RUNTIME     VIRTUAL BROADCAST DOMAIN TABLE

=============================================

        0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1

VBC -   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6

1 :     + + + + - - - - - - - - - - - -

2 :     - - - - - - - - + + + - - - - -

SYS_console>
```

> ──────────── Note ────────────
> All ports not defined as a member of a VBC are members of the
> default VBC.

get-vbc-matrix

Retrieve the current broadcast domain matrix for the switch. Here
only the broadcast address will be affected.

The first column is the source port list. The other columns are
broadcast destination ports. If a "+" is in the matrix matching up the
source port to the destination port, frames can be forwarded
between these ports. If a "-" is in the matrix matching up the source
port to the destination port, no frames can be forwarded between
the ports.

```
SYS_console>get-vbc-matrix

VBC CONNECTIVITY MATRIX


=============================================

        0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1

SRC to :  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
1  :      - + + + - - - - - - - - - - - -
2  :      + - + + - - - - - - - - - - - -
3  :      + + - + - - - - - - - - - - - -
4  :      + + - - - - - - - - - - - - - -
5  :      - - - - - + + + + + + + + + + +
6  :      - - - - + - + + + + + + + + + +
7  :      - - - - + + - + + + + + + + + +
8  :      - - - - + + + - + + + + + + + +
9  :      - - - - + + + + - + + + + + + +
10 :      - - - - + + + + + - + + + + + +
11 :      - - - - + + + + + + - + + + + +
12 :      - - - - + + + + + + + - + + + +
13 :      - - - - + + + + + + + + - + + +
14 :      - - - - + + + + + + + + + - + +
15 :      - - - - + + + + + + + + + + - +
16 :      - - - - + + + + + + + + + + + -

SYS_console>
```

Security VLANs

Each Security Virtual LAN (SVLAN) can contain one or more groups of ports. The group in a SVLAN are only allowed to send and receive packets to groups in the same SVLAN. If a group is not assigned to a specific SVLAN, it remains in the default SVLAN. Unicast packets with unknown destination addresses are sent to all port members in a SVLAN. Broadcast packets (broadcast address ffffffffff) remain within the VBC where they are received and are transmitted to only the ports in an SVLAN that are members of the receiving port VBC.

set-sec-vlan

This command establishes a Security Virtual LAN.

The SVLANs are group-oriented. There are eight groups of ports on the 8116 switch.

Table 10-1 SVLAN Groups

Group a	ports 1-2
Group b	ports 3-4
Group c	ports 5-6
Group d	ports 7-8
Group e	ports 9-10
Group f	ports 11-12
Group g	ports 13-14
Group h	ports 15-16

```
     set-sec-vlan {run|nvram|all} <group_list>

SYS_console>set-sec-vlan run a-b

Set Runtime Security Virtual entry - OK

SYS_console>set-sec-vlan run c

Set Runtime Security Virtual entry - OK

SYS_console>get-svlan-tbl run

RUNTIME     SECURITY VIRTUAL LANs TABLE

     0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1

SVLAN -  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6

1 :      + + + + - - - - - - - - - - - -

2 :      - - - - + + - - - - - - - - - -

SYS_console>
```

del-sec-vlan

This command deletes the Virtual LAN specified by lan_id.

```
del-sec-vlan {run|nvram} <lan_id>
```

lan_id is the svlan index in the SVLANs table displayed at the `get-svlan-tbl` command.

──────────── **Note** ────────────
Setting a security VLAN group with the "all" parameter will update both Runtime and NVRAM databases.

get-svlan-tbl

This command shows the table of defined Virtual LANs.

```
get-svlan-tbl {run|nvram}
```

SYS_console>get-svlan-tbl run

```
RUNTIME    SECURITY VIRTUAL LANs TABLE

===========================================

          0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1

SVLAN -  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6

1 :      + + + + + + + + - - - - - - - -

2 :      - - - - - - - - + + - - - - - -
SYS_console>
```

The default SVLAN is ports 11, 12, 13, 14, 15, and 16 (groups F, g, and H. It is not displayed by the "get-svlan-tbl" command. SVLAN 1 is ports 1, 2, 3, 4, 5, 6, 7, and 8 (groups A, B, C, and D). SVLAN 2 is ports 9, 10, (group E).

──────────────── **Note** ────────────────
If you assign ports to multiple SVLANs, they become one SVLAN and includes all the original VLAN ports.

You can view the SVLANs settings by entering the CLI "get-svlan-matrix" command, which shows the connectivity matrix of all the ports (identifies ports transmitting and ports receiving).

get-svlan-matrix

This command retrieves the Security VLANs connectivity matrix.

get-svlan-matrix {run|nvram}

SYS_console>**get-svlan-matrix run**

```
  SECURITY VLANs CONNECTIVITY MATRIX

==============================================

             0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1

SRC to :     1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
1 :          - + + + - - - - - - - - - - - -
2 :          + - + + - - - - - - - - - - - -
3 :          + + - + - - - - - - - - - - - -
4 :          + + + - - - - - - - - - - - - -
5 :          - - - - - + + + + + + + + + + +
6 :          - - - - + - + + + + + + + + + +
7 :          - - - - + + - + + + + + + + + +
8 :          - - - - + + + - + + + + + + + +
9 :          - - - - + + + + - + + + + + + +
10 :         - - - - + + + + + - + + + + + +
11 :         - - - - + + + + + + - + + + + +
12 :         - - - - + + + + + + + - + + + +
13 :         - - - - + + + + + + + + - + + +
14 :         - - - - + + + + + + + + + - + +
15 :         - - - - + + + + + + + + + + - +
16 :         - - - - + + + + + + + + + + + -
```

SYS_console>

The above example shows that port 7 can switch to ports 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, and 16.

Chapter 11
Port Monitoring Commands

set-mon-port

This command sets the monitoring port (port containing the monitoring device, sniffer port). All traffic from the port specified by the monitor command will be duplicated on assigned ports. Port is a decimal number.

```
set-mon-port <port>
```

monitor

This command sets the port to be monitored and starts the monitoring process. All traffic from this port will be duplicated on the monitoring port specified by the set-mon-port command. The monitoring device or sniffer must be connected to the monitoring port before monitoring is activated.

```
monitor <port>
```

stop-mon

This command ends port monitoring.

get-nv-mon

This command retrieves the port monitoring information stored by the save-mon command in the NVRAM.

save-mon

This command saves the current port monitoring information (including set-mon-port and monitor commands) into the NVRAM, so that the monitoring will be restarted upon device reset.

clear-nv-mon

This command clears the port monitoring information previously stored in the NVRAM with the save-mon command.

Chapter 12
Port Configuration Commands

This chapter contains instructions for configuring and displaying the ports' parameters with the Administrative Interface. Type <port-cfg> to view the related commands.

get-port-cfg

The get-port-cfg command displays the current port configuration.

```
SYS_console>get-port-cfg
```

PORT_ID	LAN_TYPE	LINK	IF_TYPE	SPEED_SEL	LAN_SPEED	FDPLX	ENABLE
1	ETH10/100	OFF	TP	FORC100	100Mbps	OFF	ON
2	ETH10/100	OFF	TP	FORC100	100Mbps	OFF	ON
3	ETH10/100	OFF	TP	FORC100	100Mbps	OFF	ON
4	ETH10/100	OFF	TP	FORC100	100Mbps	OFF	ON
5	ETH10/100	OFF	TP	FORC100	100Mbps	OFF	ON
6	ETH10/100	OFF	TP	FORC100	100Mbps	OFF	ON
7	ETH10/100	OFF	TP	FORC100	100Mbps	OFF	ON
8	ETH10/100	ON	TP	FORC100	100Mbps	OFF	ON
9	ETH10/100	OFF	TP	FORC100	100Mbps	OFF	ON
10	ETH10/100	OFF	TP	FORC100	100Mbps	OFF	ON
11	ETH10/100	OFF	TP	FORC100	100Mbps	OFF	ON
12	ETH10/100	OFF	TP	FORC100	100Mbps	OFF	ON
13	ETH10/100	OFF	TP	FORC100	100Mbps	OFF	ON
14	ETH10/100	OFF	TP	FORC100	100Mbps	OFF	ON
15	ETH10/100	OFF	TP	FORC100	100Mbps	OFF	ON
16	ETH10/100	OFF	TP	FORC100	100Mbps	OFF	ON

```
SYS_console>
```

The information displayed contains:

❑ An interface number (port-id)

❑ LAN type: ETH-10 indicates 10 Mbps Ethernet ETH-10/100 indicates 10/100 Mbps Ethernet ETH-100 indicates 100 Mbps Ethernet

❑ Link status: ON/OFF

❑ Physical Interface Type: TP

❑ Speed selected: FORC10 (10Mbps), FORC100 (100Mbps), ASENSE (Autosense)

❑ LAN Speed: 10Mbps or 100Mbps

❑ Full Duplex mode: OFF = Standard Ethernet (default Half Duplex), ON = Full Duplex

❑ Enable: ON = port enabled (default), OFF = port disabled

set-port-dplex

```
set-port-dplex <port_number> {half|full}
```

The set-port-dplex command specifies if the given port will be active in full-duplex or in half-duplex (Standard Ethernet) mode. The default is half-duplex.

```
SYS_console>set-port-dplex 2 full

Port configured in <full duplex> mode

Parameter change in NVRAM OK

SYS_console>_
```

set-speed-sel

```
set-port-sel <port-number> {asense|100|10}
```

This command specifies if port-number will negotiate a 10Mbps or 100Mbps connection, or it will autosense. If the switch is having difficulty auto-sensing the wire speed, use this command to set the correct value.

—————————————————— Note ——————————————————
If the port's link partner is in Full Duplex mode and not in ASENSE (or auto-negotiation) mode, ASENSE cannot be selected as the line speed of the port.
——

set-port-state

This command can be used to enable or disable a port when the Spanning Tree algorithm is not running. When Spanning Tree is running, set-prt-enb should be used instead.

```
set-port-state < port-number>
{enable|disable}
```

set-aggr-mode

This command sets the device mode: aggressive or relax backoff algorithm.

```
SYS_console>set-aggr-mode

   [arg #0]  enter either {enable | disable}

SYS_console>
```

The AT-8116 implements the truncated exponential backoff algorithm defined by the 802.3 standard. The set-aggr-mode command controls the number of consecutive retransmit trials (necessitated by collisions) before restarting the backoff algorithm. In aggressive mode the AT-8116 restarts the backoff algorithm after 4 consecutive transmit trials instead of 16. This results in the switch being more aggressive in accessing the media following a collision.

Chapter 13
Switching Statistics Commands

This chapter contains instructions for displaying the switching statistics. Type <statistics> to view all the related commands. The commands below provide full physical layer information as well as inter-port switching statistics.

clr-cnt

This command clears the Ethernet and bridging counters.

get-eth-cnt

This command displays the Ethernet Statistics Counters for port port-number.

```
get-eth-cnt <port-number>

SYS_console>get-eth-cnt 8

Ethernet Statistics for Port 8
================================================
Good Bytes Received: 249432

Good Multicast Bytes Received: 1011480

Good Broadcast Bytes Received: 85944

Good Bytes Sent: 107222

Good Frames Receive: 16011

Good Multicast Frames Receive: 991

Good BroadCast Frames Receive: 13773

Frames Sent: 1059

Receive and Transmit Collisions: 0

Receive and Transmit Late Collisions:0

Receive CRC or Alignment Error: 0

Receive Frame > 1518 bytes with Bad CRC: 0

Receive Fragments: 43

Receive Frame > 1518 bytes
   with Good CRC:

Bad Bytes Received: 0
================================================
SYS_console>
```

get-colls-cnt

This command displays the Ethernet collision statistics for port port-number.

```
get-colls-cnt <port-number>
```

```
SYS_console>get-colls-cnt 8

Ethernet Collision Counters for port 8
============================================
 Collision count:0

 Late Collision Count: 0


============================================

SYS_console>
```

get-rmon-cnt

Retrieve the RMON statistics group 1 counters for port.

```
get-rmon-cnt  <port>
```

get-sdist-cnt

Retrieve the RMON statistics packet size histogram for port. This command is available for Fast Ethernet ports only.

```
get-sdist-cnt  <port>
```

```
SYS_console>get-sdist-cnt 6

RMON Packet Size Distribution Counters for
port 6
===============================================
etherStatsPkts64Octets: 330
etherStatsPkts65to127Octets: 175
etherStatsPkts128to255Octets: 71
etherStatsPkts256to511Octets: 18
etherStatsPkts512to1023Octets: 21
etherStatsPkts1024to1518Octets: 3

SYS_console>
```

get-mgm-brcnt

Retrieve the counters for the management interface.

```
SYS_console>get-mgm-brcnt

Management Port Counters
===============================================
Frm   Received:       15606

Bytes Received :    1119792

Frm   Filtered :        0

Frm Received Bcast:      14219

Frm Transmited    :    29944

Frm Transmit Ucast:       344

Frm Transmit Mcast:     29556

Frm Transmit Bcast:        44

Received from port:       FRAMES            BYTES
-----------------------------------------------
       1        :          0                0
       2        :          0                0
       3        :          0                0
       4        :          0                0
       5        :          0                0
       6        :          0                0
       7        :          0                0
       8        :          0                0
       9        :          0                0
      10        :       15637          1123754
      11        :          0                0
      12        :          0                0
      13        :          0                0
      14        :          0                0
      15        :          0                0
      16        :          0                0
```

Chapter 14
Spanning Tree Commands

Spanning Tree automatically configures a loop-free topology in a bridged environment. However, note that the bridge on this switch is not VLAN-based and only one spanning tree is allowed regardless of the number of VLANs. The Spanning Tree agent is implemented in conformance to the IEEE 802.1d standard. Once spannning tree is enabled, it remains enabled even through resets or start ups.

Listed below are the configuration commands pertinent to the operation of the Spanning Tree algorithm. Type <sp-tree> to view all the related commands. For spanning tree defaults, see Appendix B, "**System Defaults**".

get-stp

Retrieve the current state of Spanning Tree. Options are enable or disable.

―――――――――――――――― Note ――――――――――――――――
The default state is disabled for spanning tree.

set-stp

This command enables or disables the Spanning Tree protocol. Spanning Tree is enabled by default, in accordance with 802.1d. Enabling or disabling Spanning Tree will not take effect until the SNMP agent is reset, via warm-reset, cold-reset or a power cycle.

```
set-stp {enable|disable}
```

`get-st-bcfg`

This command retrieves the Spanning Tree bridge parameters. If Spanning Tree is disabled, no parameters will be retrieved.

`get-st-pcfg`

This command retrieves the Spanning Tree port parameter table. If Spanning Tree is disabled, no parameters will be retrieved.

`get-st-syscfg`

This command retrieves the Spanning Tree state of all the ports.

`set-br-prio`

This command sets the Spanning Tree bridge priority of the Switch. priority is an integer in the range 0..65535.

```
set-br-prio <priority>
```

`set-br-maxage`

```
set-br-maxage <maxage>
```

This command sets the Spanning Tree bridge MaxAge. This is the amount of time between Spanning Tree configuration messages. Note that maxage is in units of seconds in the range 6..40.

`set-br-hellot`

```
set-br-hellot <hello_time>
```

This command sets the Spanning Tree bridge Hello Time. hello_time is an integer in the range 1..10. Note that hello_time is in units of seconds.

`set-br-fwdel`

```
set-br-fwdel <forward_delay>
```

This command sets the Spanning Tree bridge Forward Delay. This controls the amount of time between the listening and forwarding Spanning Tree states, and is completely unrelated to the forwarding latency. Note that forward_delay is an integer in units of seconds in the range 4..30.

set-prt-prio

This command sets the Spanning Tree port priority. port_number is the decimal port number, and port_priority is an integer in the range 1..255.

```
set-prt-prio <port_number> <port_priority>
```

set-prt-enb

```
set-prt-enb <port_number> {enable|disable}
```

This command enables or disables a port in the Spanning Tree. port_number is the integer port number.

set-prt-pcost

```
set-prt-pcost <port_number> <path_cost>
```

This command sets the Spanning Tree port path cost. port_number is the integer port number, and path_cost is an integer path cost in the range 1..65535.

Chapter 15
Using an SNMP Manager

This chapter contains instructions for the configuration and management of the AT-8116 SNMP Management System.

Configuring the AT-8116 SNMP Agent

Once connected to the network and powered ON, the AT-8116 starts operating according to factory-set default values. However, to ensure proper operation and maximum performance specific to your network configuration and to provide SNMP access, some environment-specific parameters must be configured through the Command Line Interface.

If you are configuring the switch for the first time:

Global Setup
1. Connect a terminal to the RS-232 connector.

2. Log in to the Command Line Interface.

3. Initialize all the AT-8116 parameters to their default values (see Table 1, System Default Values). Use the following command sequence:

   init-nvram (deletes all current NVRAM configrations)

   warm-reset (loads the NVRAM configuration)

4. Wait until you see the LOGIN prompt again. Login to the CLI. Now all system parameters have been initialized to their default values.

IP Setup

1. Modify the system IP configuration to match your IP network. Use the set-ip-cfg command in order to provide an IP address, a netmask and a broadcast address (see IP Commands). For example:

   ```
   set-ip-cfg 129.001.001.064 255 255.255.255.0
   129.001.001.000
   ```

   Check that the actual IP configuration matches the desired one:

   ```
   SYS_console>get-ip-cfg

   The device IP address, netmask and broadcast are:

   IP address: 129.001.001.064

   IP netmask:255.255.255.000

   IP broadcast: 129.001.001.000
   ```

2. Set the default gateway address using the set-gatew command. This should be a station that can route IP packets to non-local IP networks. For example:

   ```
   SYS_console>set-gatew 129.1.1.1
   ```

3. Confirm that the default gateway IP address was properly accepted:

   ```
   SYS_console>get-gatew

   Device default gateway address is :
   129.001.001.001
   ```

SNMP Setup

1. Set up the SNMP communities strings for the two access modes: read and write (see SNMP Commands). Confirm that the read and write communities were properly accepted. In this example, the **Read** community string is public; the **Write** community string is private. To set community strings:

```
SYS_telnet>set-comm read public

 New read community is: < public >

SYS_telnet>set-comm write private

 New write community is: < private >

SYS_telnet>

   to read if accepted:

SYS_telnet>set-comm read public

 New read community is: < public >

SYS_telnet>set-comm write private

 New write community is: < private >

SYS_telnet>
```

Chapter 16

Software Troubleshooting

This chapter provides troubleshooting hints for problems you may encounter when trying to manage the AT-8116 using an SNMP Management System.

❑ If your SNMP Manager has trouble communicating with the SNMP Agent in the Switch, check your SNMP configuration parameters.

❑ Your Network Administrator can help determine if your IP configuration (IP Address, netmask and broadcast address) is correct. If the SNMP management workstation is on a different network, be sure that you have defined an appropriate Default Gateway IP Address.

❑ Check the community string configuration by using the get-comm * command.

❑ If you are not receiving any traps, check that you have correctly entered the SNMP Management Workstation address in the trap receiver table. Display the table using the get-trap-tbl command. Check that both the IP Address and the community string are correct.

❑ If the network management station does not receive authentication failure traps, check for the Authentication Mode using the get-auth command.

❑ Check that you have a correct physical connection to the Switch. Check the LINK status.

❑ Test the connection to the SNMP Management Station by pinging it. Use the CLI: ping.

❑ If the network's physical topology has changed recently (e.g. an SNMP Management Station has been moved from one segment to another), the ARP cache may be out of date. You can use the del-arp-entry command to flush the cache.

Appendix A
Software Downloading

Requirements

- ❑ Diskette with software file to be downloaded

- ❑ DOS station host (management console, VT100 terminal or VT100 terminal emulator) or UNIX host (eg, Sun Sparc)

- ❑ TFTP program (client or server)

- ❑ Operational AT-8116

─────────────── **Note** ───────────────
When the file transfer is completed, the AT-8116 automatically resets itself and reboots with the downloaded software in about two minutes.

8116 TFTP Client Download Procedure

1. Insure that an IP Address is assigned.

    Use your terminal for Steps 2-7.

2. Set the TFTP mode to client using the set-tftp-mode command.

3. Insure that the host system for the TFTP server (if AT-8116 is the TFTP client , then the host system should be an TFTP sever) and AT-8116 are interconnected.

4. Insert the diskette with the software file into the host drive of the TFTP server.

5. Select/Create a directory into which to copy the software file, and enter this directory.

6. Copy the software file into a file with a suitable name.

7. Set the remote software file using the set-sw-file command.

8. Operate TFTP server on the remote system host and use the sw-dnld command on the AT-8116 to start download.

8118 TFTP Server Download Procedure

1. Insure that an IP Address is assigned.

2. Set the TFTP mode to the server using the **set-tftp-mode** command.

3. Set the remote software file using the set-sw-file command.

4. Insure that the host system for the TFTP client (if AT-8116 is the TFTP sever, then the host system should be an TFTP client) and AT-8116 are interconnected.

5. Insert the diskette with the software file into the host drive of the TFTP client.

6. Select/Create a directory into which to copy the software file, and enter this directory.

7. Copy the software file into a file with a suitable name.

8. Set the remote software file using the **set-sw-file** command.

9. Use the **sw-dnld** command to start download.

10. Operate the remote TFTP client.

11. Select binary transfer mode if the code is in ASCII (equivalent to octet in UNIX code).

12. Using the TFTP protocol, send the file (to be loaded into Flash memory) to the IP address of the AT-8116.

Appendix B
System Defaults

Table **B-1** System Default Values

CONSOLE	
password	NULL
prompt	SYS_console>
SYSTEM	
SW filename	changes according to revision
tftp mode	client
SNMP	
Read Community: Write Community: Authentication Mode: Traps Managers:	public private enable none
PORT CONFIGURATION	
port duplex	HALF
port select	FORC100
backoff algorithm	aggressive
SPANNING TREE	
Spanning Tree	disable
Bridge Priority	32768 0-65535
Bridge Max Age	20 6.0 - 40.0 sec
Bridge Hello Time	2 1.0 - 10.0 sec
Bridge Forward Delay	15 4.0 - 30.0
Port Priority	128 0-255
Port Cost	1000/LAN speed (Mbps)

Appendix C
Command Line Reference

Table C-1 Console Commands

help-kbd	List the console functional keys
banner	Display banner
clear	Clear console screen
login	Exit AI; do not disconnect a Telnet session
logout	Exit Admin Interface and any active Telnet session
set-page	Set console page
set-prompt	Change console prompt
set-attr-prompt	Set the prompt attributes
set-attr-msg	Set the message attributes
set-attr-text	Set the text attributes
set-passwd	Change the console password

Table C-2 System Commands

sys-stat	Show system status
get-stst-level	Show self-test level of switch
set-stst-level	Change the self-test level
warm-reset	Warm reset of device
cold-reset	Cold reset of device
get-last-err	Display information about the last fatal error
init-nvram	Initialize NVRAM to default values
get-sw-file	Retrieve SNMP agent software file name
set-sw-file	Set the SNMP Agent Software file name - for download
get-tftp-srvr	Retrieve TFTP download server IP address
set-tftp-srvr	Set TFTP download server IP address
set-tftp-mode	Set the TFTP download mode
get-tftp-mode	Retrieve the TFTP download mode
sw-dnld	Begin software download to TFTP server
set-fg-param	Set the Ethernet frame generator parameters
start-fg	Starts the Ethernet frame generator
stop-fg	Stop the Ethernet frame generator

Table C-3 IP Commands

get-ip	Show current IP address
set-ip	Set IP address
get-ip-cfg	Show current IP configuration
set-ip-cfg	Set IP address, netmask and broadcast
clear-ip-cfg	Clear IP configuration in NVRAM
get-gatew	Show default gateway
set-gatew	Define default gateway
get-arp-tbl	Display the ARP Table
del-arp-entry	Deletes an entry/all entries (*) of the ARP table
add-arp-entry	Adds an entry to the ARP table
ping	IP traffic generator
ping-stop	Stop the ping process

Table C-4 SNMP Commands

get-comm	Show current read and /or write community
set-comm	Change the read or write community
get-auth	Shows the traps authentication mode
set-auth	Sets the trap authentication mode
get-traps	Show destination stations in the trap list
add-trap	Add destination station to trap list
del-trap	Delete a destination station from trap list
get-rmon-state	Display the RMON session state

Table C-5 Switching Database Commands

get-lt-entry	Gets an LT entry at index
get-lt-16	Gets 16 LT entries starting at a given index
find-lt-addr	Searches for an address in the LT
del-lt-entry	Removes an LT entry at index
del-lt-addr	Removes an LT with a given address
add-lt-entry	Adds an LT entry
get-lt-age	Displays the LT aging period
set-lt-age	Modifies the LT aging period

Table C-6 Virtual LAN Commands

get-con-matrix	Retrieve the VLAN connectivity matrix
set-vbc-domain	Define a Virtual Broadcast domain
del-vbc-domain	Delete a Virtual Broadcast domain
get-vbc-tbl	Display the Virtual Broadcast domain table
get-vbc-matrix	Retrieve the VBC connectivity matrixmonitor
set-sec-vlan	Define a Security Virtual LAN
del-sec-vlan	Delete a Security Virtual LAN
get-svlan-tbl	Display the Security Virtual LAN table
get-svlan-matrix	Retrieve the Security VLANs connectivity matrix
set-mon-port	Set monitoring port
monitor	Set port monitoring
stop-mon	End port monitoring
get-nv-mon	Retrieve port monitoring information stored in NVRAM
save-mon	Save current port monitoring information into NVRAM
clear-nv-mon	Clear port monitoring information previously stored in NVRAM

Table C-7 Port Configuration Commands

get-port-cfg	Display the configuration of all ports
set-port-dplex	Set the port mode: full or half duplex
set-speed-sel	Set the port speed : 10Mbps, 100Mbps or Asense
set-port-state	Enable or disable a port when Spanning Tree algorithm is not running
set-aggr-mode	Enable or disable switch aggressive mode

Table C-8 Switching Statistics Commands

clr-cnt	Clear the switch Ethernet and bridging counters
get-eth-cnt	Get the Ethernet counters per port
get-colls-cnt	Get the collision distribution counters per port
get-rmon-cnt	Get the Ethernet RMON counters per port
get-sdist-cnt	Get packet size distribution counters per port
get-mgm-brcnt	Get the switching counters of the mgmt port

Table C-9 Spanning Tree Commands

get-stp	Display the Spanning Tree session state
set-stp	Enable/Disable Spanning Tree - for the next session
get-st-bcfg	Retrieve the Spanning Tree Bridge parameters
get-st-pcfg	Retrieve the Spanning Tree port parameter table
get-st-syscfg	Retrieve the Spanning Tree System Ports configuration
set-br-prio	Set the Spanning Tree bridge priority
set-br-maxage	Set the Spanning Tree bridge MaxAge
set-br-hellot	Set the Spanning Tree bridge HelloTime
set-br-fwdel	Set the Spanning Tree bridge Forward Delay
set-prt-prio	Set the Spanning Tree port priority
set-br-enb	Set the Spanning Tree port enable/disable
set-br-pcost	Set the Spanning Tree port path cost