

SmartSwitch 9000  
9T122-08  
Local Management Appendix

9031653-03

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# 9T122-08 Module Specific Information

## Introduction

This appendix contains local management information that is specific to the 9T122-08 Token Ring MicroLAN Switch Extension Module.

## Module Interfaces

The 9T122-08 Token Ring MicroLAN Switch Extension Module has five interfaces. Table 1 lists the identifying number, name, and description of each interface.

**Table 1. 9T122-08 Token Ring MicroLAN Switch Module Interfaces**

System Interface Number	Bridge Interface Number	Interface Name	Interface Description
1		SMB-1	1 Mbps System Management Bus
2		SMB-10	10 Mbps System Management Bus
3	1	FNB	Flexible Network Bus (FDDI)
4	2	TOKEN RING 1	Token Ring 1 Front Panel Interface
5	3	TOKEN RING 2	Token Ring 2 Front Panel Interface

## FNB Resource Configuration Codes

The 9T122-08 Token Ring MicroLAN Switch Extension Module provides connectivity between one of three interfaces: the front panel Token Ring interface(s) and the FDDI rings on the backplane (FNB-1 or FNB-2).

The FNB Resource Configuration Screen allows you to connect the module's front panel Token Ring interfaces to one of the chassis' two FDDI networks (FNB-1 or FNB-2) via a bridge/switch.

The FNB Resource Configuration Screen lists all the possible connections that the specified module can support on the FNB, displays the current connection, and allows you to change the connection. Table 2 lists and describes the FDDI Connections from which you can select.

**Table 2. 9T122-08 Token Ring MicroLAN Switch Module FNB Resource Configuration Codes**

<b>Configuration ID</b>	<b>FDDI Connections</b>	<b>Description</b>
1	NORING <-> TRNG	Neither the FNB-1 nor the FNB-2 on the chassis' backplane is connected to the module's bridge/switch.
2	FNB1 <-> TRNG	The FNB-1 on the chassis' backplane and the module's front panel Token Ring interfaces are connected to the same bridge/switch.
3	FNB2 <-> TRNG	The FNB-2 on the chassis' backplane and the module's front panel Token Ring interfaces are connected to the same bridge/switch.

## General Configuration Screen

The General Configuration Screen (Figure 1), displays various information about the selected module and allows you to set the following general parameters:

- Date and Time
- Screen Update Time
- Screen Lockout Time
- Host IP Address
- Subnet Mask
- Default Gateway
- Default Interface
- TFTP Gateway IP Address

```
SmartSwitch 9000 LOCAL MANAGEMENT

General Configuration

Module Name: 9T122-08          Firmware Revision: 01.08.07
Slot Number: 2                BOOTPROM Revision: 01.01.09

Module Serial #: 04           Module Date:          05/24/1996
Module Board Revision: 04     Module Time:         09:18:13
                              Screen Refresh Time: 03 sec
                              Screen Lockout Time:  15 min

FLASH Memory: 2 MB

                              Host IP Address:       XXX.XXX.XXX.XXX
                              Subnet Mask:          255.255.0.0

                              Default Gateway:      NONE DEFINED
                              Default Interface:    NONE DEFINED

                              Base MAC Address:     00-00-1D-01-03-04

                              TFTP Gateway IP:      0.0.0.0

SAVE                           RETURN
```

Figure 1. General Configuration Screen

## General Configuration Screen Fields

The following information briefly explains each General Configuration Screen field.

### **Module Serial #**

Displays the serial number of the selected module.

### **Module Board Revision**

Displays the version number of the selected module.

### **FLASH Memory**

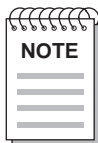
Displays the amount (megabytes) of flash memory in the selected module.

### **Module Date**

Contains a value that the module recognizes as the current date. To enter a new date, highlight the field and enter the date in MM/DD/YYYY format. The month and day portion of the date must include two digits. Therefore, enter a leading zero for months January through September, and for dates less than 10. For example, for June 4, 1996, enter 06/04/1996 (slashes are optional). If you do not enter slashes to separate the month, day, and year values, the first eight digits you enter in this field represent an entry (i.e., 06041996).

### **Module Time**

Contains a value that the module recognizes as the current time. To enter a new time, highlight the field and enter the time in HH:MM:SS format. Notice that there is no AM/PM indicator. Time should be entered based upon a 24 hour clock. For 4:07 p.m., enter 16:07:00 (colons are optional). If you do not enter colons to separate the hours, minutes, and seconds values, the first six digits you enter in this field represent an entry (i.e., 160700). For 6:12 a.m., enter 6:12:00 or 061200.



*The module's default date and time settings are indeterminate. The internal calendar and clock begin running as soon as you install the module.*

### **Screen Refresh Time**

Contains the rate at which the module's screens are updated. This setting determines how frequently (in seconds) information is updated on the screen. To enter a new refresh rate, highlight the field and enter a number. The **default** refresh rate is 3 seconds. The **range** is 3 - 99 seconds.

**Screen Lockout Time**

Contains the maximum number of minutes that the Local Management application will display a module's screen while pending input or action from a user. For example, if you enter 5 in this field, users will have up to five minutes to respond in some fashion to each of the specified module's Local Management screens. In our example, after five minutes of "idleness" (no input or action), the Local Management application terminates the session on the selected module and the Slot Selection Screen reappears. To enter a new lockout time, highlight the field and enter a number. The **default** lockout time is 15 minutes. The **range** is 1 - 30 minutes.

**Host IP Address**

Contains the Internet Protocol address currently assigned to the selected module. Set this field according to your network requirements. Highlight the Host IP Address field and enter the desired IP address using dotted decimal notation (4 decimal values between 1 and 255 separated by periods) as follows:

255.255.255.255

(255 is the maximum number that you can enter in any of the four segments. Default = 0.0.0.0 .) This address can be used by any of the system interfaces on the module.

**Subnet Mask**

Contains the subnet mask for the selected module. A subnet mask "masks out" the network bits of the IP address by setting the bits in the mask to 1 when the network treats the corresponding bits in the IP address as part of the network or subnetwork address, or to 0 if the corresponding bit identifies the host. The default subnet mask uses the first two portions of the IP address to identify the network id, leaving the rest of the IP address to identify specific nodes. To enter a new subnet mask, highlight the field and enter a new value using dotted decimal notation (4 decimal values between 1 and 255 separated by periods) as follows:

255.255.255.255

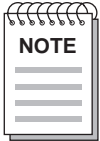
(The Subnet Mask field defaults to the natural mask value, based on the IP Address that you entered for the device.)

**Default Gateway**

Contains the IP Address of the device to which all packets addressed to an unknown network or host are sent. If you do not configure a Default Gateway, any packets that are addressed to an unknown network or host will be dropped. This field is not defined until you enter an appropriate value using dotted decimal notation (4 decimal values between 1 and 255 separated by periods).

**Default Interface (Toggle)**

Contains the number that represents the interface that is connected to the module's Default Gateway. In some instances, dissimilar modules have different corresponding interface numbers. For example, if you are assigning a default interface to a 9T122-08 module and you enter a 3, then the default interface is the Flexible Network Bus. However, if you are assigning a default interface to a 9F310-02 module and you enter a 3, then the default interface is the Internal Network Bus. See Table 1 for module-specific interface information. The **default** is NONE, meaning no default interface selected.



*The Default Interface field becomes active after you enter an IP address in the Default Gateway field.*

**Base MAC Address**

Displays the MAC Address of the selected module. This is the MAC Address of the SMB-10 interface.

**TFTP Gateway IP**

The IP address of the router that connects to or is closest to the module. Configure this address when you are performing TFTP downloads in a routed environment (if proxy ARP is disabled on the router).



## Token Ring Bridge Configuration (Screen 1)

The 9T122-08 Token Ring Bridge Configuration Screen 1 (Figure 2), provides basic setup options for making a bridge operational in your network.

```

SmartSwitch 9000 LOCAL MANAGEMENT

Bridge Configuration

Module Name: 9T122-08          Firmware Revision: 01.08.07
Slot Number: 2                BOOTPROM Revision: 01.01.09

Bridge Address: 00-00-1D-01-03-04  Bridging Interfaces: 3

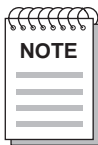
Bridge Number      (hex):      1      Type of STA:      [IEEE]
Bridge Priority Label (hex):    8000   Novell Xlat:     [NONE]
Bridge Path Cost   (hex):    0000000A

Interface #      MAC/Local Address      Bridge State      Status
-----
1 (FNB)         00-00-B8-80-C0-A0      forwarding        [ENABLED]
2 (TR1)         00-00-B8-80-C0-60      forwarding        [ENABLED]
3 (TR2)         00-00-B8-80-C0-E0      forwarding        [ENABLED]

SAVE                INTERFACE CONFIGURATION                RETURN

```

Figure 2. 9T122-08 Token Ring Bridge Configuration Screen 1



*To modify a non-toggle field on this screen, use the arrow keys to highlight the field, then press the **Enter** key. Now you can modify the field.*

## Bridge Configuration Screen Fields (Screen 1)

The following information briefly explains each Bridge Configuration Screen 1 field.

### Bridge Address

Displays the MAC Address of the bridge.

### Bridging Interfaces

Displays the total number of bridging interfaces on the selected module.

### Bridge Number

Allows you to enter a hexadecimal number that uniquely identifies a bridge when more than one bridge is used to span the same two segments. Valid bridge numbers range from 01 to 0F (15).

### Type of STA (Toggle)

Allows you to set the method that bridges use to decide which bridge is the controlling (Root) bridge when two or more bridges exist in parallel (Spanning Tree Algorithm). Valid entries include IEEE and None. Press the **Space Bar** to toggle to the desired value.



*All bridges in a network must use the same Spanning Tree protocol. The IEEE protocol has a unique format for its Bridge Protocol Data Units (BPDU). Trying to mix STA protocols results in an unstable network.*

### Bridge Priority Label

Allows you to enter a hexadecimal number that identifies the write-able portion of the Bridge ID, i.e. the first two octets of the Bridge ID. Valid bridge priority labels range from 0000 to FFFF.

### Novell Xlat (Toggle)

Novell translation, which converts MAC addresses in most significant bit (MSB) format to least significant bit (LSB). Valid choices are:

- **NONE (default)** - No translation performed for Novell IPX/SPX packets.
- **DLC** - Translation performed within the data link control layer for Novell IPX/SPX packets (provides MSB-to-LSB MAC address conversion).
- **LLC** - Translation performed within the Logical Link Control layer for Novell IPX/SPX packets (provides MSB-to-LSB conversion compatible with the 9T122 method).

**Bridge Path Cost**

Allows you to enter (as a hexadecimal number) the cost of the path to the root as seen from the specified bridge. Valid bridge path costs range from 00000001 to 0FFFFFFF.

**Interface Number**

Lists each bridge interface on the selected module; FNB, TR1, and TR2.

**MAC/Local Address**

Lists the hardware address of each listed bridge interface.

**Bridge State**

Displays the current state of each listed interface. The possible interface states include:

**Disabling:** Management has disabled this interface. No traffic can be received or forwarded while the interface is disabled.

**Learning:** The bridge is learning this interface's network addresses. The bridge enters the learning state when the Transparent Database is created (during start-up or after being deleted), or when the Spanning Tree Algorithm detects a network topology change.

**Listening:** The bridge is not adding information to the Transparent Database. The bridge is monitoring BPDU traffic while preparing to move from the learning to the forwarding state.

**Forwarding:** The bridge is on-line and this interface is forwarding traffic.

**Blocking:** This interface will not forward any traffic through the bridge.

**Status (Toggle)**

Allows you to set the bridge forwarding status of the listed interface (either ENABLED or DISABLED). Press the **Space Bar** to toggle to the desired value.

## Displaying Bridge Configuration Screen 2

To display Bridge Configuration Screen 2, use the arrow keys to highlight INTERFACE CONFIGURATION, then press the **Return** key.

## Token Ring Bridge Configuration (Screen 2)

The 9T122-08 Token Ring Bridge Configuration Screen 2 (Figure 3), provides basic setup options for making a bridge operational in your network.

```

SmartSwitch 9000 LOCAL MANAGEMENT

      Bridge Configuration

Module Name: 9T122-08          Firmware Revision: 01.08.07
Slot Number: 2                BOOTPROM Revision: 01.01.09

Bridge Address: 00-00-1D-01-03-04  Bridging Interfaces: 3

Bridge Number      (hex):      1      Type of STA:      [IEEE]
Bridge Priority Label (hex):    8000   Novell Xlat:     [NONE]
Bridge Path Cost   (hex):    0000000A

Interface #  Ring  Ring  Hop  STE  Bridge  Unknown&Broadcast
              Speed Number Count Forwarding Method Forwarding
1 (FNB)     100  041   7   STE  TP      TP
2 (TR1)     [16] 048   7   STE  [SRT]  [STE]
3 (TR2)     [16] 049   7   STE  [SRT]  [STE]

      SAVE                                RETURN
    
```

Figure 3. 9T122-08 Token Ring Bridge Configuration Screen 2

## Bridge Configuration Screen Fields (Screen 2)

The following information briefly explains each Bridge Configuration Screen 2 field.

### **Ring Speed (Toggle)**

Allows you to set each token ring interface's operating speed (either 4 Mbps or 16 Mbps). Press the **Space Bar** to toggle to the desired value.

### **Ring Number**

Allows you to set the hexadecimal number that uniquely identifies the ring to which the specified interface is connected. Valid ring numbers range from 001 to FFF.

### **Hop Count**

Allows you to set the maximum number (1 through 7) of routing descriptors allowed to be forwarded in All Routes or Spanning Tree Explorer frames.

### **STE Forwarding (Toggle)**

Allows you to manually configure whether a Spanning Tree Explorer frame is forwarded or blocked. Press the **Space Bar** to toggle to the desired value (either ENABLE or DISABLE). This is available only with the Spanning Tree Algorithm (STA) set to NONE.

### **Bridge Method (Toggle - Available on Token Ring interfaces only)**

Displays one of the following bridge methods:

- Source Route (SR) - All frames from the FNB are forwarded on the front panel Token Rings with a source route RIF. There is no transparent frame support. The Token Ring interface may only receive and transmit SR frames in this mode. All TP frames are filtered when they are received by the Token Ring interface.
- Source Route Transparent (SRT) - Performs source route bridging when required, transparent bridging when required, and translational bridging. The Token Ring interface can receive and transmit both SR and TP frames.
- Transparent (TP) - There is no source routing support. The bridge performs transparent 802.1d bridging. All SR frames are filtered when they are received.

**Unknown&Broadcast Forwarding**

Defines how frames destined for unknown destination addresses (not in the bridge database) and broadcast destination addresses are handled when the frame is transmitted by the Token Ring interfaces. This field is per bridge interface.

- For the **FDDI interface**, the frame cannot be changed. It is fixed as a transparent only (TP) network. Therefore, all unknown and broadcast frames are sent onto FDDI as TP frames.
- For the **Token Ring interfaces**, this field is selectable. Table 3 describes what choices are available and when.

**Table 3. Unknown and Broadcast Forwarding Choices**

Bridge Method	Unknown & Broadcast Forwarding Choices
TP	<b>TP</b> - Frames that are destined for an unknown destination address (not in bridge database) or a broadcast destination address are forwarded on to the Token Ring(s) as TP frames. No translation for source routing is performed.
SR	<b>ARE</b> - Frames that are destined for an unknown destination address (not in bridge database) or a broadcast destination address are forwarded onto the Token Ring(s) as All Route Explorer (ARE) frames. FDDI TP frames are translated to this type of source routed frame.  <b>STE</b> - Frames that are destined for an unknown destination address (not in bridge database) or a broadcast destination address are forwarded onto the Token Ring(s) as Spanning Tree Explorer (STE) frames. FDDI TP frames are translated to this type of source routed frame.
SRT (default)	<b>ARE</b> (See ARE definition above) <b>STE</b> (See STE definition above). This is the <b>default</b> . <b>TP</b> (See TP definition above)

## **Saving Modifications**

To save your modifications of the values on the Bridge Configuration Screen:

1. Use the arrow keys to highlight **SAVE** at the bottom of the screen, then press the **Return** key.
2. When the message "SAVED OK" appears, the edits you have made are saved. If you exit without saving, the message "NOT SAVED -- PRESS SAVE TO KEEP CHANGES" appears. If you exit without saving, your edits will be lost.

## **Exiting Bridge Configuration Screen 2**

To exit Bridge Configuration Screen 2, use the arrow keys to highlight **RETURN**, then press the **Return** key.

## Module Specific Configuration Menu

The 9T122-08 Module Specific Configuration Menu Screen (Figure 4), contains menu selections that allow you to configure the module's ports and establish ring security.

```
SmartSwitch 9000 LOCAL MANAGEMENT

Module Specific Configuration Menu

Module Name: 9T122-08           Firmware Revision: 01.08.07
Slot Number: 2                 BOOTPROM Revision: 01.01.09

PORT CONFIGURATION

TOKEN RING SECURITY

RETURN
```

**Figure 4. 9T122-08 Module Specific Configuration Menu Screen**

Use the arrow keys to highlight an option, then press the **Return** key. The selected screen appears.





## Token Ring Port Configuration Screen Fields

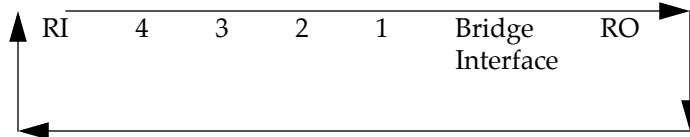
The following information briefly explains each Token Ring Port Configuration Screen field.

### Ring #

Displays the current status/settings of the module ports that are attached to each token ring. The information that appears, and whether that information is modifiable, varies according to the configuration mode you select.

### Token Flow

Graphically displays the direction in which the token travels. In other words:



## Changing From Operational Mode to Administrative Mode

The configuration mode command allows you to toggle between two values: ADMINISTRATIVE or OPERATIONAL. To change the mode:

1. Use the arrow keys to highlight the configuration mode command on the command line.
2. To toggle to the desired mode, press the **Space Bar**.
3. Press the **Return** key. The selected mode becomes effective.  
The ADMINISTRATIVE mode is detailed on page 17.  
The OPERATIONAL mode is detailed on page 19.



## Configuring (Administratively) an Individual Port

To administratively configure an individual port:

1. Use the arrow keys to highlight the value in the field of the port that you want to configure. Press the **Space Bar** until the desired value appears in the field (either ON or OFF).
2. Press the **Return** key.

## Configuring (Administratively) All Ports

To administratively configure all ports on the module, Token Ring 1 or Token Ring 2:

1. Use the arrow keys to highlight the value in the enable/disable command (lower left portion of the screen). Press the **Space Bar** until the desired value appears in the field (ENABLE ALL or DISABLE ALL, ENABLE TOKEN RING 1 or DISABLE TOKEN RING 1, ENABLE TOKEN RING 2 or DISABLE TOKEN RING 2).
2. Press the **Return** key.

## Exiting the Token Ring Port Configuration Screen

To exit the Token Ring Port Configuration Screen, use the arrow keys to highlight **RETURN**, then press the **Return** key.



**Table 4. Token Ring Port Operational Codes**

If the port is a...	And if the port is administratively turned...	Then, the operational status is:
Ring Port RI (ring-in) or RO (ring-out)	ON	<b>ACT (Active)</b> The port is on and is passing data to the ring.  <b>WRP (Wrapped)</b> The port is on, but it is autowrapped, either because of a cable failure or because the cable is not connected.
	OFF	<b>DIS (Disabled)</b> The port is off (wrapped by Management).
Lobe Port	ON	<b>INS (Inserted - phantom link is detected)</b> The lobe port is inserted into the ring.  <b>ENB (Enabled - no phantom link is present)</b> The lobe port is not inserted into the ring.
	OFF	<b>LNK (Linked - phantom link is detected)</b> The lobe port is trying to gain access to the ring, but it has been prevented.  <b>BYP (Bypassed -no phantom link is present)</b> The lobe port is not attempting to gain access to the ring.
	ON or OFF	<b>FLT (Speed Fault)</b> The ring speed of the port is in conflict with the ring speed of the designated token ring. The port will remain wrapped.

## Exiting the Token Ring Port Configuration Screen

To exit the Token Ring Port Configuration Screen, use the arrow keys to highlight **RETURN**, then press the **Return** key.

## Token Ring Secured Station Configuration

The 9T122-08 Token Ring Secured Station Configuration Screen (Figure 8), allows you to control access to the module's token ring network.

The **Disabled** mode (by default) allows all new stations to enter the ring.

When ring security is enabled in **Alarm Only** mode, the module stores the MAC address of each station on the token ring network in a secure database or "allowed list." The module can store up to 250 station MAC addresses on the allowed list. The module retains the allowed list in its battery-backed Non-Volatile Random Access Memory (NVRAM). When the module is powered up or reset, all MAC addresses are retained and ring security is reenabled automatically.

The Alarm Only mode allows new stations to enter the ring, but a "station added" trap/alarm notifies the Network Management Station (NMS) of the event. The trap/alarm includes the new station's MAC address so that the network manager can decide if the new station should be allowed on the ring.



*Do not enter **Remove/Alarm** mode without first entering the **Alarm Only** mode or adding nodes to the allowed list. All nodes not appearing in the list, currently active on the ring, WILL BE REMOVED!*

The **Remove/Alarm** mode sends a "Remove Station MAC Frame Command" to new stations attempting to enter the ring, and a trap/alarm to the NMS informing it of the action taken. If, after three attempts, the station (outside the hub) cannot be removed from the ring, a trap/alarm is sent to the NMS informing it that "the station could not be removed." Also, the port is disabled for the station directly connected to the hub and a trap/alarm is sent indicating port removal.

To access the 9T122-08 Token Ring Secured Station Configuration Screen from the Module Specific Configuration Menu:

1. Use the arrow keys to highlight the **Token Ring Security** option.
2. Press the **Enter** key.

The 9T122-08 Token Ring Secured Station Configuration Screen (Figure 8), appears.

```

SmartSwitch 9000 LOCAL MANAGEMENT
Token Ring Secured Station Configuration

Module Name: 9T122-08           Firmware Revision: 01.08.07
Slot Number: 2                 BOOTPROM Revision: 01.01.09

                Token Ring #1
            Entry  Station Address

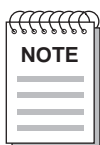
                001  00-00-83-F2-7F-60
                002  00-00-A6-30-19-61
                003  00-00-A6-30-19-78
                004  00-00-B8-28-08-C8
                005  00-00-B8-80-C0-60
                006  00-00-B8-DC-00-01
                007  00-00-B8-F0-A0-D5
                008  40-00-22-22-22-22

Stn Edit 00-00-00-00-00-00      ADD      Security Mode [ Alarm Only ]

                                [TOKEN RING 1]      [ 9-16 ]

                                                RETURN
    
```

**Figure 8. 9T122-08 Token Ring Secured Station Configuration Screen**



*Up to 8 station addresses appear on the screen. If additional station addresses exist, a command containing the range of station addresses, such as [ 9-16 ], appears on the command line (bottom of the screen). To view any additional station addresses, highlight the range of station addresses command, then press the **Return** key.*



## Token Ring Secured Station Configuration Screen Fields

The following information briefly explains each Token Ring Secured Station Configuration Screen field.

### Station Address

Lists the MAC address of each station on the security “allowed” list. Up to 250 MAC addresses can appear in the list.

### Stn Edit

Allows you to enter the MAC Addresses of stations that you want to add or delete from the security “allowed” list.

## Token Ring Security Configuration Screen Commands

### Add/Delete (Toggle)

Allows you to manually add or delete stations from the security “allowed” list.



*Before you add stations manually, see the Alarm Only security mode information on the following page.*

To **manually add** a station to the allowed list:

1. Use the arrow keys to highlight the **Stn Edit** field, then press the **Return** key.
2. Enter the MAC Address of the station you want to add to the allowed list, then press the **Return** key. You must enter the MAC Address in XX-XX-XX-XX-XX-XX format.
3. If the Add/Del toggle command displays Add, then proceed to step 6. Otherwise, use the arrow keys to highlight the letters Del in the Add/Del command.
4. Press the **Space Bar** until the command toggles to display Add.
5. Press the **Return** key.  
The station appears in the Station Address list. Ignore step 6.
6. Press the **Return** key.  
The station appears in the Station Address list.

To **manually delete** a station from the allowed list:

1. Use the arrow keys to highlight the **Stn Edit** field, then press the **Return** key.
2. Enter the MAC Address of the station you want to delete from the allowed list, then press the **Return** key. You must enter the MAC Address in XX-XX-XX-XX-XX-XX format.
3. If the Add/Del toggle command displays Del, then proceed to step 6. Otherwise, use the arrow keys to highlight the word Add in the Add/Del command.
4. Press the **Space Bar** until the command toggles to display Del.
5. Press the **Return** key. The station is removed from the Station Address list. Ignore step 6.
6. Press the **Return** key.  
The station is removed from the Station Address list.

#### **Security Mode (Toggle)**

Allows you to set one of three security modes for the module's token ring.



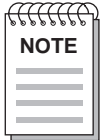
*Make sure you understand the consequences of changing security modes.*

Each mode offers more security than the previous mode. Select from the following modes:

- **Disabled** - This is the default setting. Use this mode to temporarily disable ring security so that new stations can enter the ring.
- **Alarm Only** - In this mode, new stations can enter the ring and are added to the allowed list, but a "Station Added" trap/alarm is sent to the Network Management Station. This trap message is only sent once, and it includes the new station's MAC address so that the network manager can decide if the new station should be allowed on the ring.

When temporarily disabling ring security to allow new users to enter the ring, use the Alarm Only mode to reenable ring security. In Alarm Only mode, the management module stores the MAC address of each station on the ring in the allowed list. This eliminates entering MAC addresses one at a time using the Stn Edit field.

- **Remove/Alarm** - This is the highest level of ring security. In this security mode, the ring is locked to new stations. The Remove / Alarm mode sends a “Remove MAC Frame” command to a new station attempting to enter the ring, and a trap / alarm to the NMS informing it of the action taken. If, after three attempts, the station cannot be removed from the ring, remove alarm sends a trap / alarm “Remove Failure” to the NMS, informing it that the station could not be removed.



*If you change directly from Disabled mode to Remove/Alarm mode, all stations that have not been added to the allowed list will be removed from the token ring.*

## Selecting a Security Mode

To select a Security Mode:

1. Use the arrow keys to highlight the **Security Mode** field.
2. Press the **Space Bar** to toggle to the desired security mode (either Disabled, Alarm Only, or Remove / Alarm).
3. Use the arrow keys to highlight the **SAVE/EXECUTE** command, then press the **Return** key. The selected mode of ring security becomes effective.

## Viewing Previous/Next Page of Station Addresses

To view the previous/next page (if there is one) of station addresses, use the arrow keys to highlight the appropriate range of station addresses command (for example, [ 9-16 ]), then press the **Return** key.

## Exiting the Token Ring Secured Station Configuration Screen

To exit the Token Ring Secured Station Configuration Screen, use the arrow keys to highlight **RETURN**, then press the **Return** key.

## Bridge Statistics Screen

The 9T122-08 Bridge Statistics (TOTAL) Screen (Figure 9), displays the module's transparent bridge and source route bridge statistics. The statistics are categorized as follows:

- Transparent Unicast
- Transparent Broadcast
- Source Route Unicast
- Source Route Broadcast

```
SmartSwitch 9000 LOCAL MANAGEMENT
Bridge Statistics (TOTAL)

Module Name: 9T122-08           Firmware Revision: 01.08.07
Slot Number: 2                 BOOTPROM Revision: 01.01.09

FDDI Interface :

      Transparent  Transparent  Source Rte  Source Rte  Totals
      Unicast     Broadcast   Unicast     Broadcast
Frames Transmitted:           0           0
Frames Received:             0           0
Kbytes Transmitted:          0           0
Kbytes Received:             0           0
Frames Filtered:             0           0

[ TOTAL ] [ FNB ] [REFRESH 3sec] RETURN
```

Figure 9. 9T122-08 Bridge Statistics (TOTAL) Screen

## Bridge Statistics Screen Fields

The following information briefly explains each Bridge Statistics Screen field.

### **Interface**

Identifies the interface type as either FDDI Interface, TOKEN RING Interface #1, or TOKEN RING Interface #2.

### **Frames Transmitted**

Displays the number of (transparent unicast, transparent broadcast, source route unicast, and source route broadcast) frames transmitted by the interface, as well as the total number of frames transmitted (sum of the four categories).

### **Frames Received**

Displays the number of (transparent unicast, transparent broadcast, source route unicast, and source route broadcast) frames received by the interface, as well as the total number of frames received (sum of the four categories).

### **Kbytes Transmitted**

Displays the number of (transparent unicast, transparent broadcast, source route unicast, and source route broadcast) kilobytes transmitted by the interface, as well as the total number of kilobytes transmitted (sum of the four categories).

### **Kbytes Received**

Displays the number of (transparent unicast, transparent broadcast, source route unicast, and source route broadcast) kilobytes received by the interface, as well as the total number of kilobytes received (sum of the four categories).

### **Frames Filtered**

Displays the number of (transparent unicast, transparent broadcast, source route unicast, and source route broadcast) frames filtered by the interface, as well as the total number of frames filtered (sum of the four categories)

## Bridge Statistics Screen Commands

### **TOTAL / ACCUMULATE / DELTA (Toggle)**

Allows you to:

- Display a running TOTAL of statistics (statistics since the module was inserted into the chassis).
- Reset the statistics to zero and then ACCUMULATE and display figures from that point in time forward.
- Display statistics and then reset the statistics to zero each time the screen is refreshed (DELTA).

Table 5 shows the various statistics after four screen refreshes:

**Table 5. Statistics After Four Refreshes**

	After 1st Screen Refresh	After 2nd Screen Refresh	After 3rd Screen Refresh	After 4th Screen Refresh
<b>TOTAL</b>	1623	1636	1685	1712
<b>ACC</b>	0	13	62	99
<b>DELTA</b>	0	13	49	27

Press the **Space Bar** to toggle to the desired value, then press the **Return** key.

#### **FNB / TOKEN RING 1/TOKEN RING 2 (Toggle)**

Allows you to select the interface for which statistics are displayed.

- If you select FNB, statistics for the FDDI interface are displayed.
- If you select TOKEN RING 1, statistics for the module's number one token ring interface are displayed.
- If you select TOKEN RING 2, statistics for the module's number two token ring interface are displayed.
- Press the **Space Bar** to toggle to the desired value, then press the **Return** key.

#### **REFRESH (Toggle)**

Allows you to select the interval at which the screen will be updated (the **range** is 3 - 99 seconds). To **increase** the number of seconds, press the **Space Bar** while the cursor is on the command. To **decrease** the number of seconds, press the **Back Space** key while the cursor is on the command.

#### **CLEAR**

A command that only appears when you select ACCUMULATE as a statistic reporting method. The CLEAR command allows you to manually reset the screen's statistics to zero and then start to accumulate statistics from that point in time. For example, you may have accumulated statistics for 45 minutes, but now you want to see accumulated statistics for the current period. In this case, you would position the cursor onto the CLEAR command and press the **Space Bar**. The screen's statistics will reset to zero and start to accumulate again.

#### **RETURN**

Allows you to exit the 9T122-08 Bridge Statistics Screen.

## Token Ring LAN Statistics

The 9T122-08 Token Ring LAN Statistics (TOTAL) Screen (Figure 10), displays the module's error statistics.

```

SmartSwitch 9000 LOCAL MANAGEMENT
Token Ring LAN Statistics (TOTAL)

Module Name: 9T122-08          Firmware Revision: 01.08.07
Slot Number: 2                BOOTPROM Revision: 01.01.09

Frames Transmitted:           0          Ring Number:           0x048
Frames Received:              0          Ring Status:           Normal
KBytes Transmitted:           0          Ring Speed (Mbps):     16
KBytes Received:              0          Stations on Ring:      5
Beacon States:                0          Ports Enabled:         6
Ring Purges:                  0 Active Monitor Changes: 0
                               Active Monitor Address: 00-00-B8-F0-A0-D5

ISOLATING ERRORS              NON-ISOLATING ERRORS
Line Errors:                   0          Lost Frame Errors:     0
Burst Errors:                  0          Frame Copied Errors:   0
AC Errors:                     0          Rcvr Congestion Errors: 0
Abort Transmit Errors:         0          Token Errors:          0
Internal Errors:               0          Frequency Errors:      0

[ TOTAL ] [TOKEN RING 1] [REFRESH 3sec]          RETURN

```

**Figure 10. 9T122-08 Token Ring LAN Statistics (TOTAL) Screen**

## Token Ring LAN Statistics Screen Fields

The following information briefly explains each Token Ring LAN Statistics Screen field.

### **Frames Transmitted**

Displays the total number of LLC frames transmitted on the token ring.

### **Frames Received**

Displays the total number of LLC frames received on the token ring.

### **Kbytes Transmitted**

Displays the total number of kilobytes transmitted on the token ring.

### **Kbytes Received**

Displays the total number of kilobytes received on the token ring.

### **Beacon States**

Displays the number of times that a beacon even occurred on the token ring.

### **Ring Purges**

Displays the number of times that an Active Monitor on the token ring generated a ring purge MAC frame to clear ring problems.

### **Ring Number**

Identifies the source route ring number (a hexadecimal value) assigned to this ring.

### **Ring Status**

Displays the current condition of the token ring. Valid conditions include Unknown, Closed, Normal, Purge, Contention, and Beaconsing.

### **Ring Speed (Mbps)**

Displays the token ring's operating speed (either 4 Mbps or 16 Mbps).

### **Stations on Ring**

Displays the number of active stations on the token ring.

### **Ports Enabled**

Displays the number of ports on the token ring that have an ENABLE status.

### **Active Monitor Changes**

Displays the number of times that the Active Monitor has changed from one station to another since the module was powered up.



**Active Monitor Address**

Displays the MAC Address of the station that currently is designated as the Active Monitor.

**ISOLATING ERRORS**

**Line Errors**

Displays the number of corrupt frames that have been detected by a station on the token ring.

**Burst Errors**

Displays the number of times a signal is not received by a station on the token ring.

**AC Errors**

Displays the number of times that two successive AMP or SMP frames are received with A and C bits set at zero.

**Abort Transmit Errors**

Displays the number of times that a station transmits an abort delimiter while transmitting.

**Internal Errors**

Displays the number of times that a station encounters a recoverable internal error. This information helps to detect a station in marginal operating condition.

**NON-ISOLATING ERRORS**

**Lost Frame Errors**

Displays the number of times that a station's TRR timer expires before the station receives the ending delimiter of the frame transmitted.

**Frame Copied Errors**

Displays the number of times that a node receives a frame with its address as the destination address, however the Address Recognized bit is already set to '1'.

**Rcvr Congestion Errors**

Displays the number of times that a station on the token ring recognizes its address, but it cannot copy the frame because the buffer is full.

**Token Errors**

Displays the number of times that a token on the token ring has encountered a problem along its path.

**Frequency Errors**

Displays the number of times that the frequency of an incoming signal differs by more than 0.6% from the local oscillator.

**Token Ring LAN Statistics Screen Commands****TOTAL / ACCUMULATE / DELTA (Toggle)**

Allows you to:

- Display a running TOTAL of statistics (statistics since the module was inserted into the chassis).
- Reset the statistics to zero and then ACCUMULATE and display figures from that point in time forward.
- Display statistics and then reset the statistics to zero each time the screen is refreshed (DELTA).

Table 6 shows the various statistics after four screen refreshes:

**Table 6. Statistics After Four Refreshes**

	After 1st Screen Refresh	After 2nd Screen Refresh	After 3rd Screen Refresh	After 4th Screen Refresh
<b>TOTAL</b>	1623	1636	1685	1712
<b>ACC</b>	0	13	62	99
<b>DELTA</b>	0	13	49	27

Press the **Space Bar** to toggle to the desired value, then press the **Return** key.

**TOKEN RING 1/TOKEN RING 2 (Toggle)**

Allows you to select the interface for which statistics are displayed.

- If you select TOKEN RING 1, token ring statistics for the module's number one interface are displayed.
- If you select TOKEN RING 2, token ring statistics for the module's number two interface are displayed.

Press the **Space Bar** to toggle to the desired value, then press the **Return** key.

**REFRESH (Toggle)**

Allows you to select the interval at which the screen will be updated (the **range** is 3 - 99 seconds). To **increase** the number of seconds, press the **Space Bar** while the cursor is on the command. To **decrease** the number of seconds, press the **Back Space** key while the cursor is on the command.

**CLEAR**

A command that only appears when you select ACCUMULATE as a statistic reporting method. The CLEAR command allows you to manually reset the screen's statistics to zero and then start to accumulate statistics from that point in time. For example, you may have accumulated statistics for 45 minutes, but now you want to see accumulated statistics for the current period. In this case you would position the cursor onto the CLEAR command and press the **Space Bar**. The screen's statistics will reset to zero and start to accumulate again.

**RETURN**

Allows you to exit the 9T122-08 Token Ring LAN Statistics Screen.

## **Exiting the Bridge Statistics Screen**

To exit the Bridge Statistics Screen, use the arrow keys to highlight **RETURN**, then press the **Return** key.

