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Stinger™

E3-ATM Trunk Module Guide

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Stinger E3-ATM Trunk Module Guide

E3-ATM trunk module overview

The E3-ATM trunk module (TM) provides an E3 link for the aggregate ATM stream from the Stinger to a terminating ATM switch. It supports two 34.368Mbps interfaces. One primary interface that connects to one ATM switch and one bypass interface for a redundant connection from the primary interface of a backup E3-ATM trunk module.

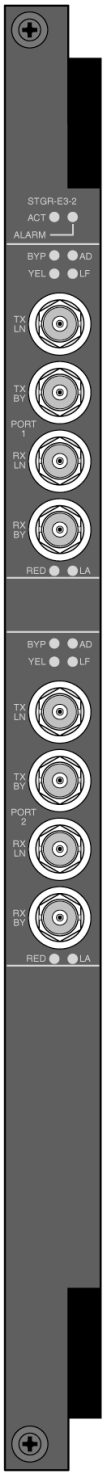
After installing an E3-ATM trunk module and connecting it to the E3 facility, you verify its operation by observing the status lights. You then configure the physical interface. A status profile displays the status of the E3 line and any error conditions,

Installing an E3-ATM trunk module

See the *Stinger Hardware Installation Guide* for installation instructions. You can install up to two active E3-ATM trunk modules in a Stinger™ unit.

Figure 1 shows the E3-ATM module.

Figure 1. E3-ATM module



Interpreting E3-ATM trunk module status lights

All status lights (LEDs) except LA are lit upon startup or restart and remain so until the trunk module passes power-on self test (POST). If no status lights are lit, the E3 interface either is disabled or is receiving an alarm indication signal (AIS).

Table 2 explains the E3-ATM trunk module status lights.

Table 2. E3-ATM trunk module status lights

Light	Color	Description
Red	red	Red Alarm. On indicates the E3 interface is experiencing loss of receive signal.
Yel	yellow	Yellow Alarm. On indicates the E3 interface has detected Far End Receive Failure indication transmitted from the other side.
Byp	yellow	Bypass. On indicates the line is in bypass mode.
LA	green	Link Active. On indicates the E3 interface is enabled and has not detected any error conditions.
LF	yellow	Loss of Frame. On indicates the E3 interface is out of frame alignment.
LA (Yellow) ON	yellow	AIS detected. On indicates the local device has received an alarm indication signal.

Configuring the E3-ATM trunk module

The Stinger unit creates an E3-ATM profile containing the following parameters for each E3 interface detected in the system. The parameters are shown with default settings for the first port of a trunk module in slot 17.

```
[in E3-ATM/{ shelf-1 trunk-module-17 1 }]
name = ""
physical-address* = { shelf-1 trunk-module-17 1 }
enabled = no
spare-physical-address = { any-shelf any-slot 0 }
sparing-mode = inactive
```

```
[in E3-ATM/{ shelf-1 trunk-module-17 1 }:line-config]
trunk-group = 9
nailed-group = 1
call-route-info = { any-shelf any-slot 0 }
loopback = no-loopback
high-tx-output = no
framer-mode = g832-adm
vpi-vci-range = vpi-0-255-vci-32-8191
vc-switching-vpi = [ 0 0 0 0 0 0 0 ]
clock-source = not-eligible
```

```
clock-priority = middle-priority
cell-payload-scramble = yes
```

Parameter	Specifies
Name	Name of the interface. The default value is the interface address in *shelf*`:`*slot*`:`*item* format (for example, `1:2:3`), but you can assign a text string of up to 16 characters.
Physical-Address	Physical address of the trunk port in the Stinger unit.
Enabled	Enable/disable the E3-ATM interface. (Disabled by default.)
Spare-Physical-Address	Physical address of the trunk port to be used as a spare.
Sparing-Mode	Redundancy mode for the port.
Trunk-Group	*Not currently used.* Leave the default value (zero).
Nailed-Group	Nailed-group number for the E3-ATM physical interface. A Connection or RADIUS profile specifies this number to make use of the interface, as described in Chapter 6 of the Stinger Configuration Guide, "Configuring ATM Circuits," and Chapter 7, "Configuring Terminating ATM Connections." Each interface is assigned a unique default number, so you do not need to modify this parameter. If you assign a new value, it must be a number from 1 to 1024 that is unique within the system. See "Displaying E3 port status and nailed groups" on page 5 for related information.
Activation	Line activation mode. Only the `static` setting is currently supported.
Call-Route-Info	*Not currently used.* Leave the default value (the zero address).
Loopback	Enable/disable loopback for diagnosing connectivity or possible equipment problems. Loopback is disabled by default, which is required for normal operations.
High-Tx-Output	Enable/disable high transmit output. The default is `no`, which is correct for E3 cables that are less than 255 feet long. For cables longer than 255 feet, set to `yes`.
Framer-Mode	E3-ATM framer mode. Following are valid values: `g832-adm` (G832 framing, ATM direct cell mapping and fixed-stuffing) `g832-adm-frame-locked` (Frame-locked E3-ATM G832) `g832-adm-loop-timed` (Loop-timed E3 -ATM G832) For more information see "Setting E3 framing formats" on page 5.
VPI-VCI-Range	Valid range of virtual channel identifier (VCI) numbers to be used with specified virtual path identifiers (VPIs) for virtual channel connections (VCCs).
VC-Switching-VPI	Array of up to seven VPIs to use for virtual channel (VC) switching.
Clock-Source	Enable/disable obtaining the system clock signal from the port.
Clock-Priority	Priority of the interface as the system's clock source.

Displaying E3 port status and nailed groups

To see the nailed-group numbers for trunk ports, use the ATMTrunks command. For example, the command output that follows shows the nailed-group numbers for all trunks, including the E3 lines. In this example, the system has one E3-ATM trunk module installed in slot 18.

```
admin> atmtrunks  -a

All OC3 ATM trunks:
OC3 Lines                (dvOp   dvUpSt  dvRq    sAdm    nailg)

All E3 ATM trunks:
E3 Lines                 (dvOp   dvUpSt  dvRq    sAdm    nailg)
Line    { 1 18  1 }       (Up      Idle    UP      UP     00851)
Line    { 1 18  2 }        (Up      Idle    UP      UP     00852)
```

Setting E3 framing formats

You can specify C-bit Physical Layer Convergence Protocol (PLCP) or C-bit ATM Direct Mapping (ADM) framing format for a E3-ATM interface. Both sides of a E3-ATM link must agree about the framing format.

The PLCP format incurs some overhead for framing. ADM format does not. When ADM framing is used, the entire E3 payload is used for ATM cells. Within each format, the framer can operate in the following modes:

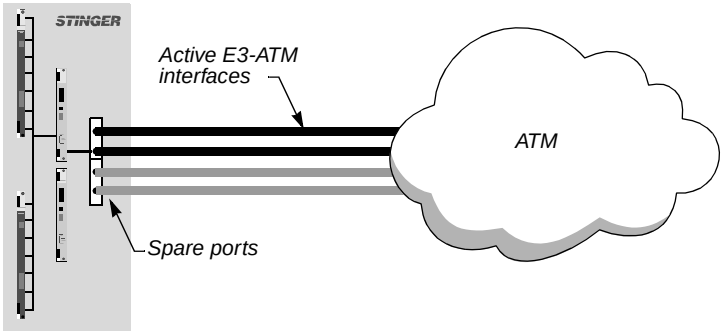
Free-running and fixed-stuffing	The E3 transmit clock signal and the PLCP frame are derived from an onboard oscillator. This mode is typically used when the line is neither providing the clock signal (frame-locked) nor synchronizing to an incoming clock (loop-timed).
Loop-timed	The Stinger unit obtains the clock signal from the other side of the link.
Frame-locked	The Stinger unit provides the clock signal.

Free-running means that the E3 transmit clock is derived from an on board oscillator. Fixed stuffing applies to PLCP framing. It means that the PLCP frame is also being derived from the on board oscillator. The free-running and fixed-stuffing mode is typically used when the line is neither providing the clock (frame-locked) nor synchronizing to an incoming clock (loop-timed).

Example of E3-ATM configuration

In this example (see Figure 3), the administrator enables two E3-ATM interfaces and designates the ports of the other E3-ATM trunk module as spare ports, for use if the primary trunk ports become inactive. Because two ports are spares, the administrator increases the number of VCCs that can be handled by both of the primary ports from 8192 to 16384.

Figure 3. E3 interfaces to the ATM network



The following commands list the trunk port profiles:

```
admin> dir e3-atm
40  08/03/1999 15:33:35  { shelf-1 trunk-module-1 2 }  1:17:2
25  08/03/1999 15:37:13  { shelf-1 trunk-module-2 1 }  1:18:1
25  08/03/1999 15:38:25  { shelf-1 trunk-module-2 2 }  1:18:2
40  08/04/1999 10:18:22  { shelf-1 trunk-module-1 1 }  1:17:1
```

The following commands enable the ports of the first trunk module and make them spares:

```
admin> read e3-atm {1 trunk-module-1 1}
E3-ATM/{ shelf-1 trunk-module-1 1 } read

admin> set enabled = yes

admin> set spare-physical-address shelf = 1

admin> set spare-physical-address slot = 18

admin> set spare-physical-address item-number = 1

admin> set sparing-mode = automatic

admin> write
E3-ATM/{ shelf-1 trunk-module-1 1 } written

admin> read e3-atm {1 trunk-module-1 2}
E3-ATM/{ shelf-1 trunk-module-1 2 } read

admin> set enabled = yes

admin> set spare-physical-address shelf = 1

admin> set spare-physical-address slot = 18

admin> set spare-physical-address item-number = 2

admin> set sparing-mode = automatic

admin> write
E3-ATM/{ shelf-1 trunk-module-1 2 } written
```

The following commands add VPI 10 and VPI 20 as valid VPIs for virtual channel switching on the first and second active ports, respectively. The addition of these VPIs doubles the number of VCCs the ports can handle, from 8K VCCs to 16K:

```
admin> read e3-atm {1 17 1}
E3-ATM/{ shelf-1 trunk-module-1 1 } read

admin> set line-config vc-switching-vpi 2 = 10
```

```
admin> write
E3-ATM/{ shelf-1 trunk-module-1 1 } written

admin> read e3-atm {1 18 1}
E3-ATM/{ shelf-1 trunk-module-2 1 } read

admin> set line-config vc-switching-vpi 2 = 20

admin> write
E3-ATM/{ shelf-1 trunk-module-2 1 } written
```

Checking ATM trunk interface status

The Stinger unit creates a E3-ATM-Stat profile for each of its E3 interfaces. The profiles provide information about the state of the physical interfaces, error counters, and other status information. The error counters in the E3-ATM-Stat profile are cleared when the E3 physical interface becomes active (synchronized). The counts accumulate every second if an error occurs.

Following are the E3-ATM-Stat parameters, shown with sample settings for an active line:

```
[in E3-ATM-STAT/{ shelf-1 trunk-module-2 1 }]
physical-address* = { shelf-1 trunk-module-2 1 }
line-state = active
spare-physical-address = { any-shelf any-slot 0 }
sparing-state = sparing-none
vpi-vci-range = vpi-0-255-vci-32-8191
vc-switching-vpi = 0
vcc-vpi = [ 0 0 0 0 0 0 0 ]
f-bit-error-count = 0
p-bit-error-count = 0
cp-bit-error-count = 0
feb-error-count = 0
bpv-error-count = 0
loss-of-signal = False
loss-of-frame = False
yellow-receive = False
ais-receive = False
```

Parameter	Description
Physical-Address	Physical location of the E3-ATM line within the Stinger system.
Line-State	The overall state of the E3 line, which can be any of the following states: `active` - Line is enabled and a multipoint connection established. `does-not-exist` - Link is not physically on the trunk module. `loss-of-signal` - Near end has lost the signal. `loss-of-frame` - Near end has lost framing (also known as a red alarm). `yellow-alarm` - Near end is receiving a yellow alarm from the far end, indicating a loss of framing there. `ais-receive` - Near end is receiving an alarm indication signal (AIS).

Parameter	Description
Spare-Physical-Address	The redundant peer of this trunk port. If the current port is the primary trunk port, the value identifies its spare (secondary) trunk port. If the current port is the secondary trunk, the value identifies the primary trunk port.
Sparing-State	The state of the redundancy function. `sparing-none` indicates that redundancy is not enabled. If redundancy is enabled and the current port is the primary trunk port, the value can be `primary-active` or `primary-inactive.` If redundancy is enabled and the current port is the secondary trunk port, the value can be `secondary-active` or `secondary-inactive`.
VPI-VCI-Range	Current valid VCI range configured for the port.
VC-Switching-VPI	Array of VPIs used for virtual channel switching.
VCC-VPI	*For internal use only.*
F-Bit-Error-Count	Number of F-bit errors. If three or more errors occur in up to 16 consecutive F-bits in a E3 M-frame, a E3 out-of-frame defect is detected. If an out-of-frame defect is consistent for up to 10 seconds, a E3 loss-of-frame is detected.
P-Bit-Error-Count	Number of P-bit parity errors. These errors occur when the system receives P-bit code on a E3 M-frame that is not identical to the corresponding P-bit code that was calculated locally.
CP-Bit-Error-Count	Number of CP-bit parity errors.
FEB-Error-Count	Number of far-end C-bit coding violations reported from the far end block error count.
BPV-Error-Count	Number of bipolar violation (BPV) errors. BPV errors can indicate that the line sent consecutive one bits with the same polarity. It can also mean that three or more consecutive zeroes were sent, or an incorrect polarity was detected.
Loss-of-Signal	Loss of signal on the line. `False` indicates that the carrier is maintaining a connection.
Loss-of-Frame	Loss of frame on the line (also known as a red alarm.) `False` indicates that the line is up and in frame.
Yellow-Receive	Far end loss-of-frame (yellow alarm) occurred on the line. `False` indicates that a yellow alarm was not received.
AIS-Receive	Far end is sending an alarm indication signal (AIS). `False` indicates that the local device has not received an AIS.

For details about E3 line errors, see RFC 1407, *Definitions of Managed Objects for the DS3/E3 Interface Type.*

E3-ATM trunk module specifications

Table 3 provides the E3-ATM trunk module specifications.

Table 3. E3-ATM trunk modules specifications

Category	Specification
Physical dimensions	Height: 15 inches (38.1 cm) Width: 1.06 inches (2.69 cm) Depth: 5 inches (12.7 cm) Weight: 1.5 pounds (0.68 kg)
Power requirements	11.5 W
Temperature range	0° to 40°C (32° to 104°F)
Operating humidity	0 to 90%, non condensing
Agency approvals	Electromagnetic Emissions Certifications: FCC Part 15 Class A, CISPR Class A
Interface standards	ITU G.703 ITU G.705
Other standards supported	ATM Forum UNI 3.0/3.1 ITU G.804
Physical interfaces	Four (two active, two standby) ATM UNI 3.0/3.1 cell-bearing E3 (34.368 Mbps) ports supporting G.751 framing and direct-cell mapping according to G.804. BNC connector according to ANSI T1.404