Vanguard Managed Solutions

Vanguard Applications Ware
Serial Feature Protocols

AC100 Protocol

Notice

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Overview

Introduction

This document describes how to configure and use the AC100 protocol on Vanguard products.

AC100 is a synchronous protocol that supports a Terminal Packet Assembler/ Disassembler (AC100 TPAD) used to interact with a Nortel Host Packet Assembler/ Disassembler (HPAD).

What Does AC100 Do?

An AC100 TPAD port passes messages from terminals to a host computer over an X.25 network. It polls, receives messages from the terminals, and establishes a data path to the Nortel host ports. The Nortel host ports (HPADs) interpret data coming from an AC100 TPAD with a protocol called AC200.

How Does It Work?

The AC100 TPAD operates as a synchronous full-duplex port, supports only the SIMP type of connection, and has the RS-232 type interface. In SIMP connections, no control signal handshaking is necessary for a connection to be made to this port; the connection is held high at all times (except when you boot either the node or port). The port disable operation lowers the DTR/DSR and the port enable operation raises the DTR/DSR.

Platform Support

All Vanguard products capable of supporting the Serial Applications Ware can use the AC100 protocol.

In This Manual

About The AC100 Protocol

Features

The implementation of the AC100 provides these features:

- Flexible networking technology (FRADs) replaces out-dated dedicated equipment, such as Intelligent Communications Controllers (ICCs).
- The protocol is fully spoofed at access points for reduced network traffic (only data passed over network).
- Compatible with Northern Telecom HPAD (AC200) implementation.
- Support for Mux and Minisites.

Typical Topology

Figure 1 shows a typical network topology on which an AC100 TPAD would reside.

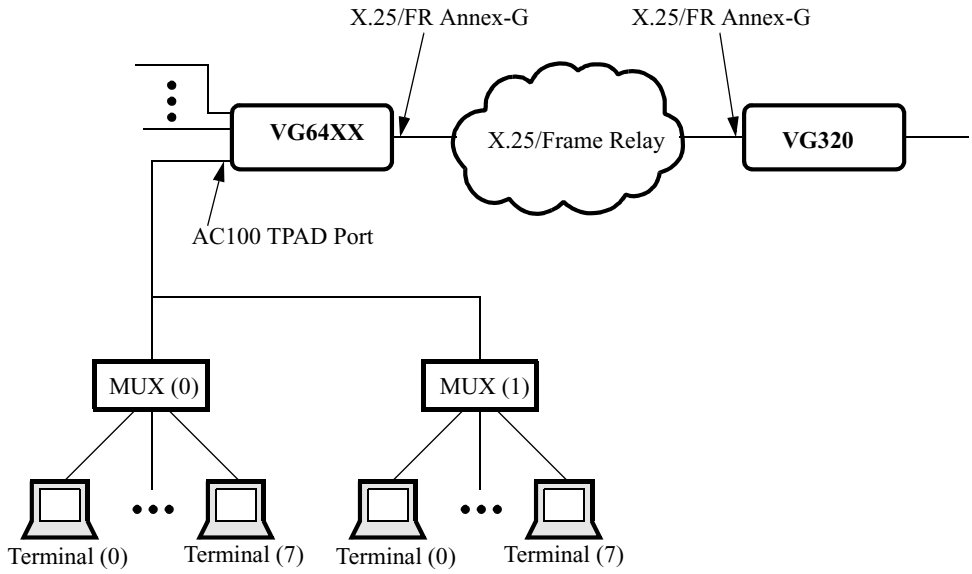


Figure 1. Typical AC100 Application

Addressing

Introduction

A typical AC100 application would include two types of site; Minisites and Muxsites. These connect to a multidrop line, from the AC100 TPAD port which supports a maximum of 16 sites.

Muxsites

A Muxsite, as the name implies, is a multiplexer which supports a maximum of 8 terminals. The Muxsite streamlines traffic from the terminals since only one of them can communicate with AC100 TPAD at a time. Of the possible 16 site numbers, 0-6 and 8-14 are designated as Muxsites. The terminals can have the addresses 0 to 7.

The AC100 TPAD sends General and Specific polls (Refer to the “Polling” section on page 9) to a Muxsite. If a Muxsite does not respond to number of General Polls configured for the “No Response Limit” parameter, or responds with an invalid response, the site is considered to be out of service, or ‘dead’. If one device on the site does not respond to a Specific Poll, the AC100 TPAD continues polling other devices on the site until it receives a response from one of the devices.

If none of the devices on a Muxsite sends a valid response to a General Poll, the AC100 TPAD moves the site to the Dead list. (Refer to the “Live and Dead Sites” section on page 18.)

Minisites

A Minisite is a cluster of up to 4 terminals that are directly connected to the AC100 TPAD. The terminals can have the addresses 0, 1, 2 or 3. Of the possible 16 site numbers, the site numbers 7 and 15 are designated as Minisites.

The AC100 TPAD only sends Specific polls (See the “Polling” section on page 9.) to a Minisite. If a valid response is not received from the Minisite, the AC100 TPAD moves the site to the Dead list. (Refer to the “Live and Dead Sites” section on page 18.)

Addressing Scheme

Figure 2 shows the addressing scheme for a typical AC100 topology:

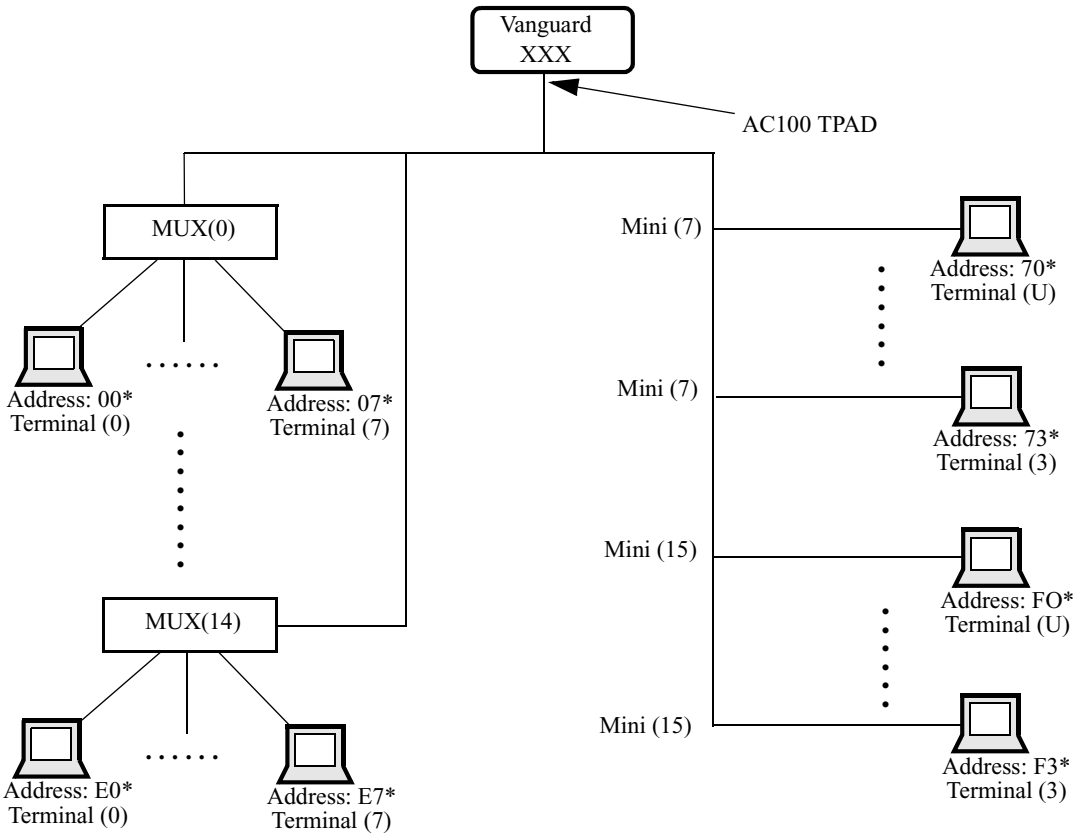


Figure 2. Addressing of AC100 Network Devices

Note

All addresses shown in Figure 2 are hexadecimal; all others use decimal notation.

Protocol

Introduction

The AC100 protocol has these basic characteristics:

- Character oriented (8-bit characters) synchronous protocol
- A slave site transmits only in response to poll
- A master (AC100 TPAD) can transmit at any time
- 7 data bits with one parity bit
- The parity of a SYN character is even; all other characters have odd parity
- Sync filling is not allowed

Frame Components

Figure 3 shows the components of an AC100 frame.

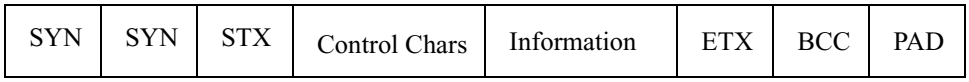


Figure 3. AC100 Frame Components

This table describes the components of the AC100 frame format.

Character	*Hex*	*Description*
SYN	0x96	Synchronization character
STX	0x02	Start of Text character
Control		Control Chars: This field identifies the addresses and the type of segment. This component can be 2 to 6 characters in length.
Information		Data. These components can be 0 to 128 characters in length. However, none of the characters between STX and ETX may have bit patterns corresponding to the ASCII codes for STX or ETX. If they do, they are ignored.
ETX	0x83	End of Text character. This component signals the end of a data block.
BCC	0x00.0 xFF	Block Check Character. This character facilitates a longitudinal redundancy check which compares the frame sent to the frame received.
PAD	0x80	Padding between one frame and the next.

Segments

The AC100 transmission unit is called a segment. The Information field in each AC100 segment can be 64, 112, or 128 characters in length. A complete display or printer message may be composed of several segments.

Operations

Introduction

This section describes following principles of AC100 operation:

- General Frame Format
- Polling
- Poll Responses
- Live and Dead Sites
- Connection Establishment
- Data Flow

General Frame Format

Introduction

This section describes the AC100 frame format.

Frame Format

Figure 4 shows the AC100 general frame format:

Preamble	Header		Info	Trailer	
SYN SYN	STX	C1...C6	Data	ETX	LPC

Figure 4. AC100 Frame Format

This tables describes each part of the frame format:

Frame Part	*Description*
Preamble	Consists of at least two even parity SYNC characters. Provides character framing. Enables the receiving device to recognize STX characters.
Header	Starts with one STX character. Followed by two to six control characters
Information	Contains user data from 0 to 128 characters. This field can contain any character except STX and ETX.
Trailer	Contains frame terminating character, ETX. Longitudinal Parity Check (LPC) character follows ETX. The parity of the LPC is odd.

Control Characters

This table describes AC100 special control characters.

Control Character	Bits	Parity	Description
SYN	0x96 - 10010110	EVEN	Used to synchronize the transmission and this is the only even parity character in transmission.
STX	0x02 - 00000010	ODD	Used as the first character of a data block and thus indicates the start of the frame.
ETX	0x83 - 10000011	ODD	Indicates the end of the frame.
ESC	0x9B - 10011011	ODD	Used in Escape Poll. It signifies that the following two bytes constitute the poll and are to be interpreted as the control characters TA and TC2. **Note** It also means that the three bytes starting with the Escape character are to be excluded in the Longitudinal Parity Check (LPC) calculation.
PAD	0x80 - 10000000	ODD	Used as padding after a segment has been sent out on the X.25 link between the AC100 TPAD and HPAD.
IDLE	0x7F - 0111111	ODD	Used when the link is idle or termination is in progress.

Frame Transmission

The transmission is bi-synchronous, bit serial, and full duplex.

The data interchanged on the access line are in the form of eight-bit characters. The bits are numbered zero to seven, where zero indicates the least significant bit and seven indicates the most significant bit. They are transmitted in that order. The first seven bits define the character and the eighth is the parity bit.

Polling

Introduction

The AC100 TPAD polls all AC100 type devices that are connected to it.

Poll Types

This tables describes the three main AC100 poll types.

Poll Type	Description
General	A control frame originating from the Remote Line Modem Controller (RLMC) and directed to a particular site address. Control characters TA and TC2 define the site address to be polled. For a General poll, the device address is irrelevant. **Note** The AC100 TPAD only sends General polls to a Muxsite.
Specific	A control frame originating from the RLMC and directed to a specific site address and device address. Control characters TA and TC2 define the site address, and the device address, to be polled.
Escape	A sequence inserted by the ICC within the information field of the output frames. It consists of the odd-parity ESC character (0x9B), followed by the Terminal Address and Terminal Control characters. The Escape poll can be either a Specific or a General poll. The Escape poll sequence is excluded in the block checking calculation (LPC).

Poll Structure

Figure 5 shows the structure of a poll segment.

Figure 5. Poll Segment

Figure 6 shows the structure of a terminal address.

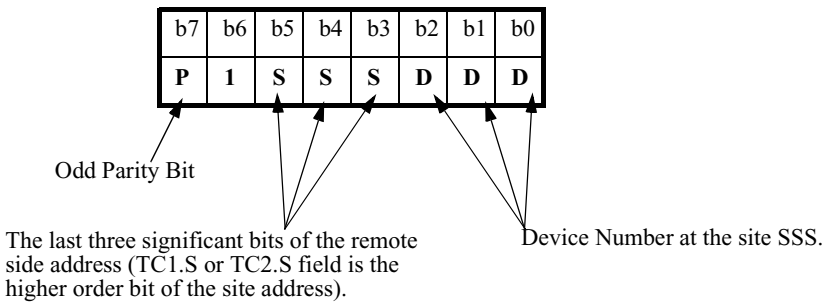
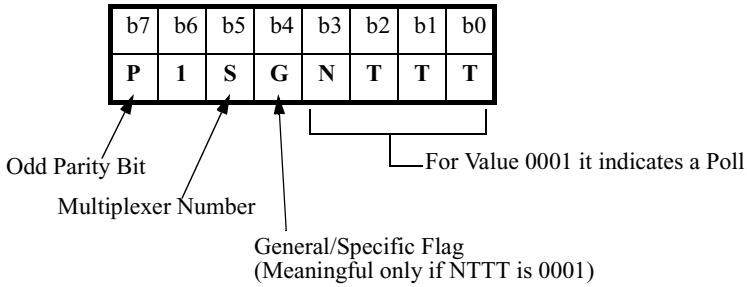


Figure 6. Terminal Address (TA) Character

Figure 7 shows the of a terminal control character.



Note: General/Specific Flag
(Meaningful only if NTTT is 0001)

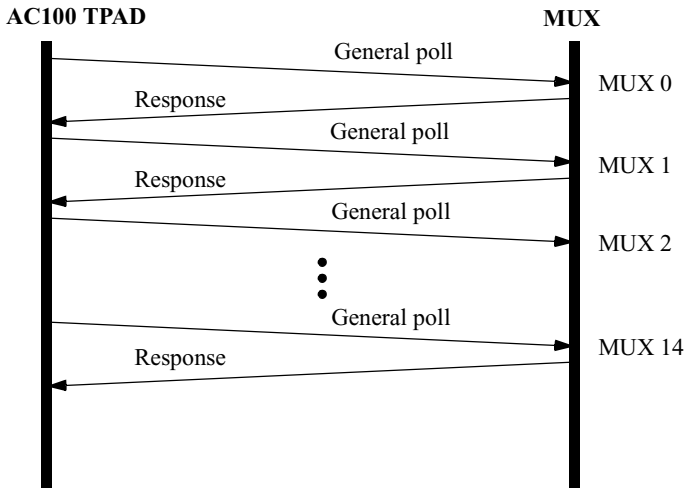
Figure 7. Terminal Control (TC2) Character

General Poll

A General poll is always sent to a Muxsite. (A General poll is never sent to a Minisite because there is no device, like a Mux, to control line contention on it.)

A General poll has the G field (See Figure 7) Terminal Control character set to 1. A poll that has the G field set to 1 means that any device under that Mux can respond to this poll. In a General poll, the device address field is irrelevant.

Figure 8 shows the sequence of a General poll to a Muxsite.



A response here indicates either a no data response or a single segment data. The AC100 TPAD will poll the next Muxsite if there is no responses from that Muxsite.

Figure 8. General Poll Cycle

Specific Poll

Specific polls are sent to both Mini and Muxsites.

The following sections describes how Specific Polls are used with each type of site.

Minisite

When the AC100 TPAD sends a poll to the Minisite, it sends a Specific poll. Sending a Specific poll avoids contention between devices under the same Minisite.

Figure 9 shows the sequence of a Specific poll to a Minisite.

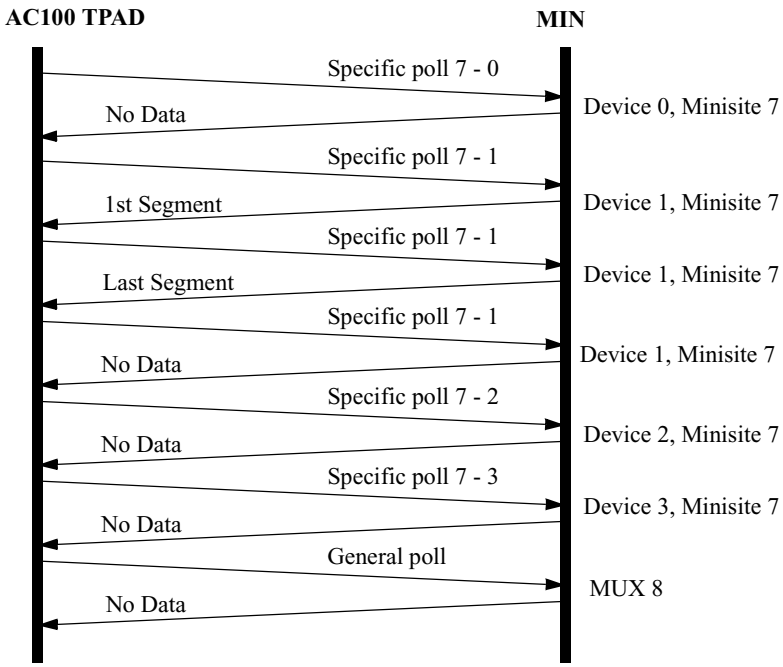


Figure 9. Specific Poll to a Minisite

Muxsite

When the AC100 TPAD sends a General poll to a Muxsite and receives an Extended Data segment in response, the General poll cycle is temporarily suspended and a Specific poll cycle is started to the device which has responded. This cycle continues until the AC100 TPAD receives one of the following:

- a no data response
- up to 32 segments from the device
- consecutive no responses for the number of times configured for the No Response Limit parameter

If there is no response to the polls, the AC100 TPAD marks the device as Dead and then resumes the General poll cycle.

Figure 10 shows the sequence of a Specific poll to a Muxsite.

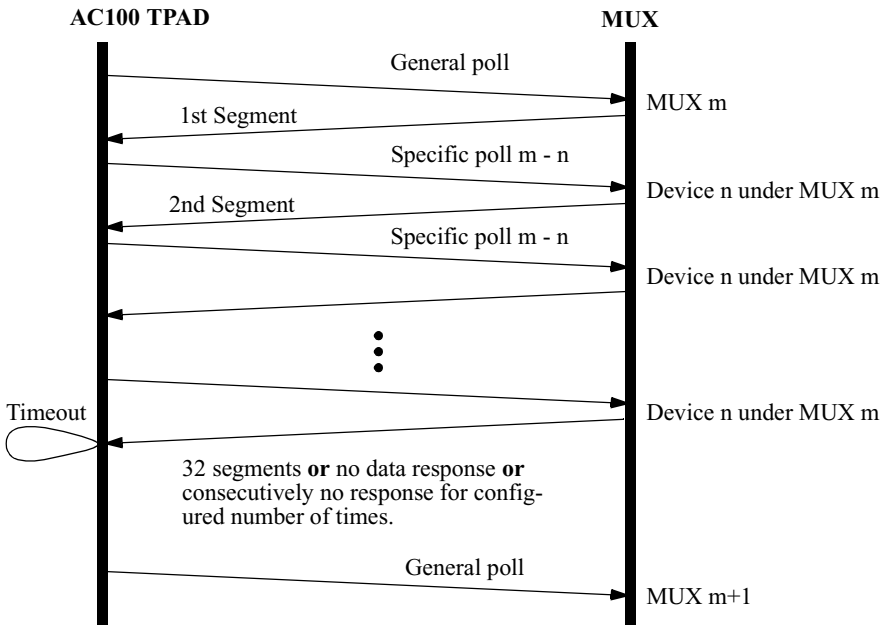


Figure 10. Specific Poll Cycle to a Muxsite

Escape Poll

An Escape poll speeds up collection of input frames from the devices. It can be either a General poll or a Specific poll.

Figure 11 shows the format of an Escape Poll.

ESC	TA	TC2

Figure 11. Escape Poll Frame Format

The AC100 TPAD starts a timer when any data segment from the HPAD is to be transmitted to the devices. If the Escape poll timer expires and the segment still being transmitted, the AC100 TPAD inserts the Escape poll sequence in the segment being transmitted and transmits the remaining part of the segment.

The Escape poll is only inserted if there is no input in progress. If a response is being received, the expiry of this timer does not result in an escape poll being inserted in the segment being sent out.

Note

Processing delays may offset the insertion of the Escape poll in the data segment by about 10 - 15% of the time configured, depending on the line speed. (This offset ensures that there is no sync filling since the protocol does not permit sync filling.)

Poll Responses

Introduction

The AC100 TPAD recognizes the following responses to its poll.

- Normal Envelope
- Extended Envelope
- No Data Response

The AC100 TPAD expects a response only from the site it has polled. If a device under another site responds, the AC100 TPAD discards the frame, increments the error counter and continues with its polling cycle.

Note

The AC100 TPAD discards all frames that do not have an ETX character.

Valid Responses

There are three types of valid data responses:

- Normal data response
- Extended data response
- No data response

Figures 12 through 14 illustrate the structure of each response type and the table that follows provides a definition of each.

SYN	SYN	STX	TA	TS1	LA2	DATA	ETX	LPC

Figure 12. Normal Data Response

SYN	SYN	STX	TA	TS1	LA3	E1	DATA	ETX	LPC

Figure 13. Extended Data Response

SYN	SYN	STX	TA	TS1	ETX	LPC

Figure 14. No Data Response

Figure 15 shows the structure of a terminal address.

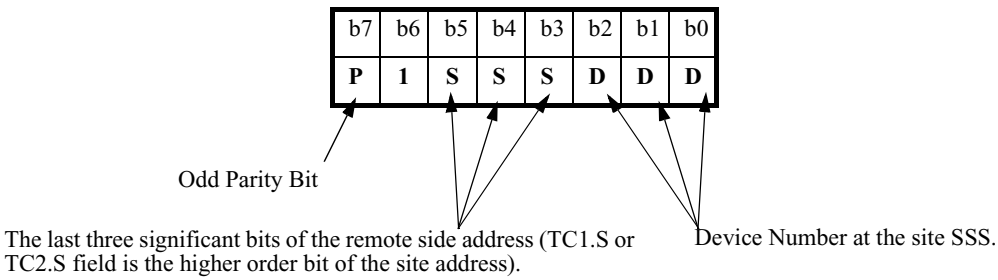


Figure 15. Terminal Address (TA) Character

Figure 16 shows the structure of a TS1.

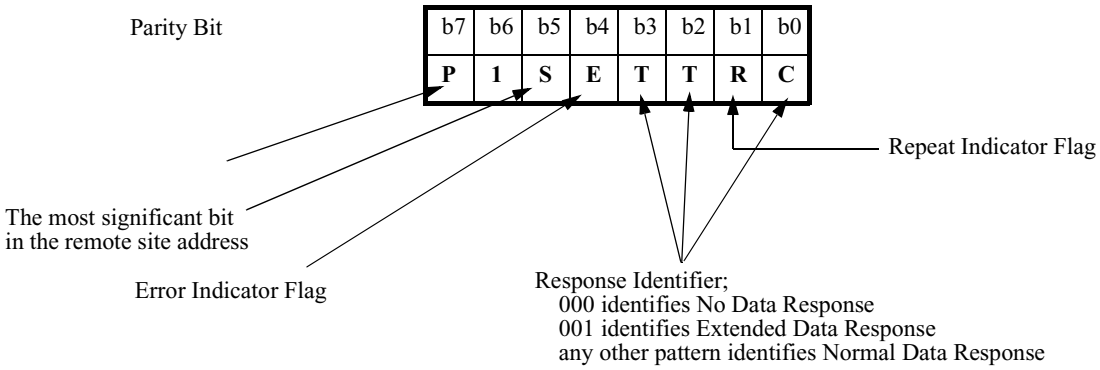


Figure 16. TS1 Character

Figure 18 shows the structure of an LA2.

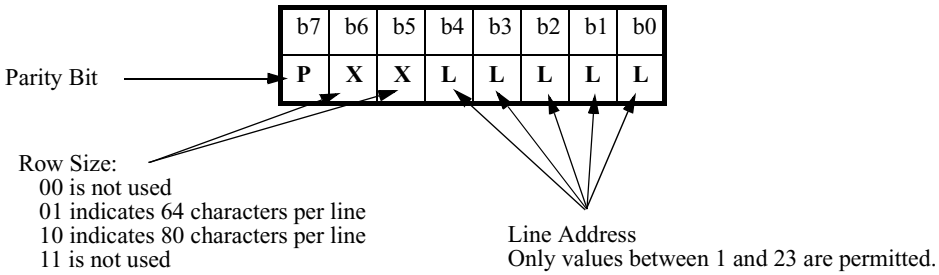


Figure 17. LA2 Character

Figure 18 shows the structure of an LA3.

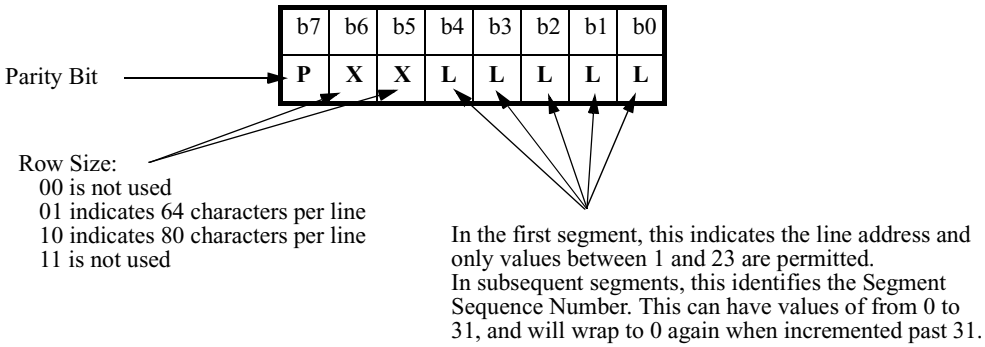


Figure 18. LA3 Character

Figure 19 shows the structure of an E1.

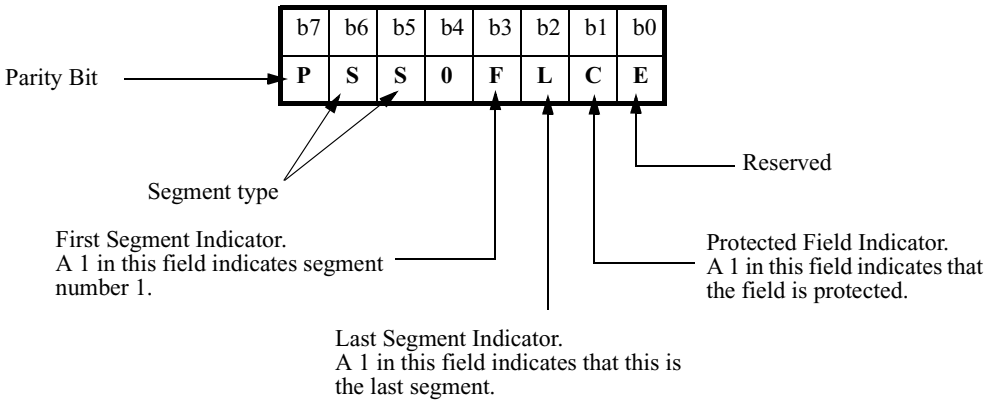


Figure 19. E1 Character

This table explains valid responses to a poll:

Response	Structure	Reaction
Normal Envelope	TS1, LA2	If the AC100 TPAD receives a Normal Envelope in response to its poll, it forwards the data segment to the host after stripping off the STX.
Extended Envelope	TS1, LA3, E1 TCC = 001	If the AC100 TPAD receives an Extended Envelope in response to its poll, it starts a Specific poll cycle to the address of the device that has sent the first segment. This Specific poll cycle terminates if the AC100 TPAD receives either 32 segments or a No Response is received for the number of times configured for this parameter. If No Data Response is received from the device, the AC100 TPAD will poll the next device. The AC100 TPAD stores the segments in the Receive Buffer (See “Receive Buffer” section on page 25.) after stripping off the STX and forwards them to the HPAD once the connection is established.
No Data Response	TA, TS1, ETX TTC = 000	If the AC100 TPAD receives a No Data Response, the AC100 TPAD polls the next site.

Response Timer

The Response Timer cycle operates using this sequence:

- The AC100 TPAD starts the Response Timer upon the transmission of a poll segment (T1)
- The Response Timer is terminated when a response is sensed.
- The Timer expires here.

Note

A response is said to be sensed if the STX, TA, and TS characters are received.

Figure 20 shows the Response Timer cycle.

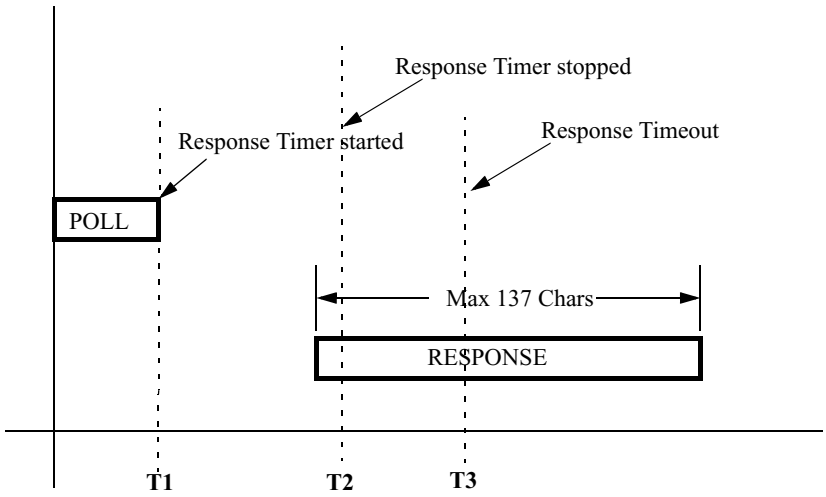


Figure 20. Response Timer Cycle

No Response Limit to a General Poll

When the AC100 TPAD receives no response to a General poll to a particular site, it polls the same site again until the configured number of attempts is reached.

In Figure 21, the configured number of the No Response Limit parameter is 3, so, in the third General poll, the AC100 TPAD assumes the site is Live if it receives a Valid Response.

If it receives no response to the third poll, the AC100 TPAD assumes that the site Dead and moves it to the Dead list. (See “Live and Dead Sites” section on page 18.)

Figure 21 is a diagram of the Response Timer Cycle for a General poll.

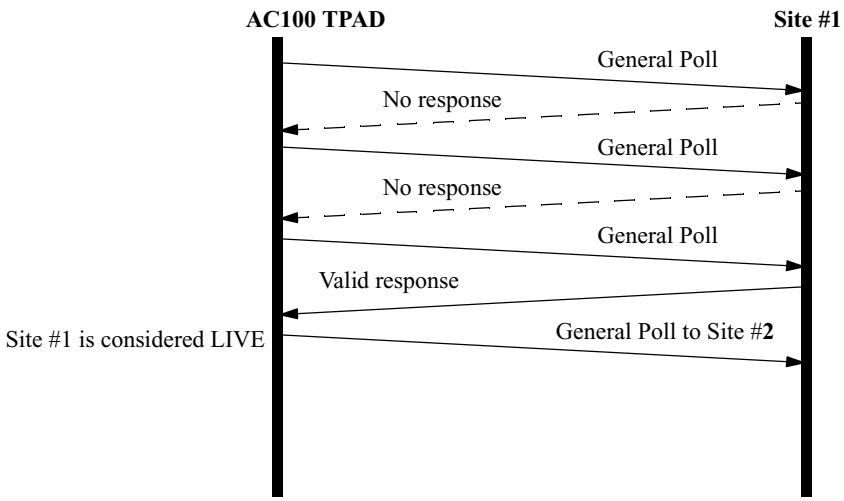


Figure 21. No Response to a General Poll

No Response Limit to a Specific Poll

When the AC100 TPAD starts a Specific poll cycle and receives no response, it polls the same site again until it reaches the configured number of attempts.

Note

The AC100 TPAD expects a response only from the site it has polled. If a device under another site responds, the AC100 TPAD discards the frame, increments the error counter, and polls the next site.

In Figure 22, the configured number of the No Response Limit parameter is 3, so, in the third Specific poll, the AC100 TPAD assumes the site is Live if it receives a Valid Response.

If, in the same poll cycle, the AC100 TPAD receives no response for another poll, it tries again two times before marking the site Dead. (See “Live and Dead Sites” section on page 18.)

Figure 22 is a diagram of the response cycle to a Specific poll.

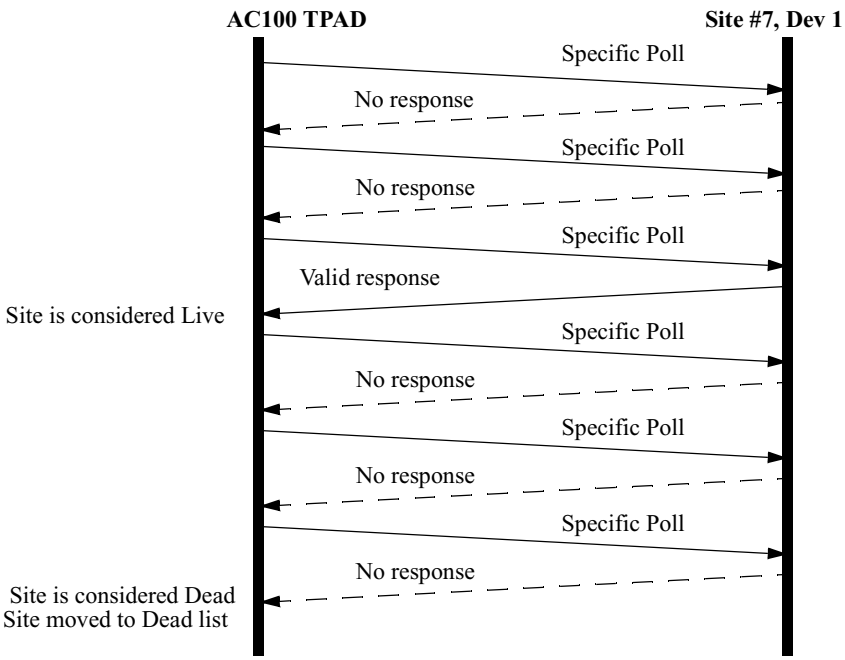


Figure 22. No Response to a Specific Poll

Live and Dead Sites

Introduction

This section describes the two site states, Live and Dead.

The AC100 TPAD maintains two site lists, a Live list and a Dead list. Initially all the sites are considered Live and are in the Live list. A site remains in the Live list if it responds to the AC100 TPAD polls with a valid data response. (See “Valid Responses” on page 13.)

Changing site Status

This table describes the circumstances under which sites are moved to the Dead list.

If...	*Then...*
The site being polled (as identified by the addressing scheme) is a Muxsite	The AC100 TPAD sends out a General Poll
There is no response to this poll from that site	The AC100 TPAD continuously polls that Muxsite for the number of times configured in the No Response Limit or until it receives a valid response
There is no response from that site for configured number of consecutive polls	That site is moved into the Dead list.

The AC100 TPAD polls one site from the Dead list after a configured number of Live list poll cycles. If the Dead site responds with a valid data response, the AC100 TPAD moves it back to the Live list.

If the site does not respond to the AC100 TPAD polls within the number of tries configured in the No Response Limit parameter, the site is moved to the Dead list.

Polling Protocol

When the AC100 TPAD completes polling all the Live sites for the number of times configured in the Number of Live List poll cycles parameter, it then polls one site from the Dead list. If any device from that site responds, that site is moved to the Live list.

Each device in a Minisite is treated individually during the polling cycle. The lists (Live/Dead) will have individual entries for each device in case of Minisites and will have one entry for every Muxsite.

Connection Establishment and Clearing

Introduction

This section describes the rules that AC100 uses for establishing and breaking connections.

For every Muxsite and Minisite, the AC100 TPAD sets up a switched connection over an X.25 network with the Nortel HPAD. The AC100 TPAD establishes one connection for a Minisite, and all the devices under that Minisite share this connection. The maximum possible number of simultaneous connections between the AC100 TPAD and HPAD is 16.

AC100 TPAD tries to establish a connection towards the host only on reception of a Valid Response to its polls. Only when the site responds does the AC100 TPAD try to establish a connection with the HPAD.

Call Requests

When the AC100 TPAD receives a valid response from a site, the AC100 TPAD sends a Call Request to the HPAD.

The AC100 TPAD generates the call request using the X.25 associated with Autocall Mnemonic parameter. (See “Autocall Mnemonic” section on page 32.) The Call User Data (CUD) field of the call request packet contains the RLMC number (1 byte) and the site number (1 byte). The first byte of CUD is the RLMC number (0-7) and the second byte of the CUD field is the site number (0-15).

Note

The AC100 TPAD does not accept calls from the HPAD. HPAD initiated calls are cleared.

Call Clears

All data segments that are received as a result of polling are queued until the AC100 TPAD establishes a connection with the HPAD. The AC100 TPAD flushes the queue, if it receives Call Clear for its Call Requests for as many as the configured number of Autocall Attempts. If the number of Autocall Attempts is less than the configured value, or if it is configured for unlimited retries, the AC100 TPAD will start the autocall retry timer. On the expiry of this timer, the TPAD will try to reestablish the connection with the HPAD. Figure 23 shows how the AC100 TPAD behaves after receiving a Call Clear from the HPAD.

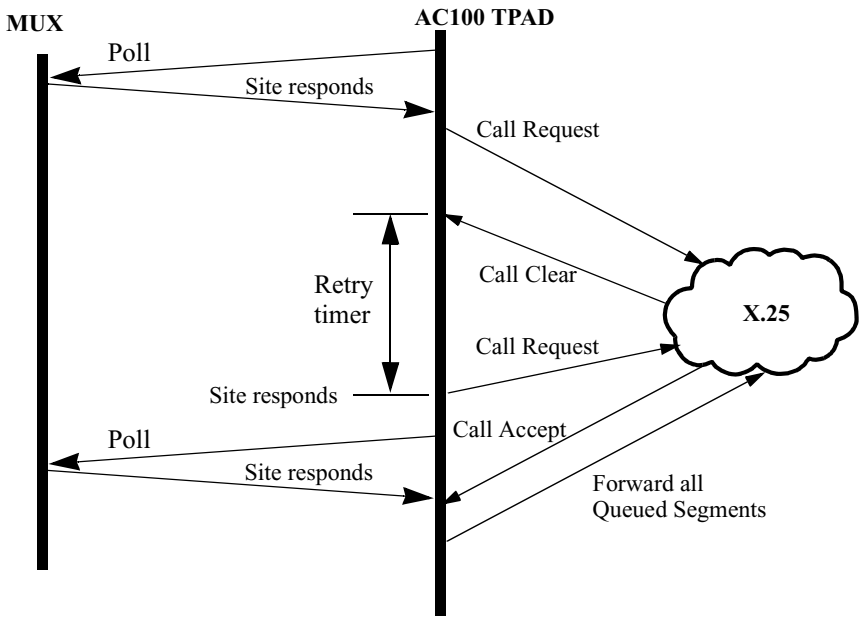


Figure 23. Connection Establishment with the HPAD

Phantom Message

You can configure a site to issue a phantom message to the HPAD once the AC100 TPAD establishes a connection with the HPAD. To the HPAD, the phantom message appears as a data message. It indicates to host the path that a Muxsite or Minisite is using.

Figure 24 shows the structure of a phantom message.

SYN	SYN	STX	TA	TS1	LA3	E1	DATA	LPC

Figure 24. Phantom Message Format

Connection Clearing

An AC100 TPAD clears a connection in the following situations:

- Port is Booted
- Port is Disabled
- Site is Booted
- Site is Disabled
- Site is moved to the Dead list
- On receipt of X.25 RESET packet (A RESET packet indicates to the AC100 TPAD that it must re-establish the X.25 window due to packet loss.)

The connection can also be broken by the HPAD. If the HPAD clears a connection, the AC100 TPAD always tries to re-establish the connection with the HPAD.

Call Re-routing

Call re-routing to alternate HPAD is done via call redirection service on the Nortel DPN equipment. The AC100 TPAD does not offer any special support for this.

Note

AC100 does not support the ping command that is commonly used to query the network delay between the HPAD and the AC100 TPAD.

Special Messages

The AC100 TPAD supports a special message **//CON**. Figure 25 shows the structure of this special message. This message provides user feedback and diagnostics.

SYN	SYN	STX	TA	TS1	LA3	E1	//CON	ETX	LPC

Figure 25. Special Message Format

When a //CON message is received, the TPAD responds, by sending the frame shown in Figure 26, to the terminal.

SYN	SYN	STX	TA	TC1	LA1	DATA	ETX	LPC

Figure 26. Special Message Response Format

Figure 27 shows the TC1 structure.

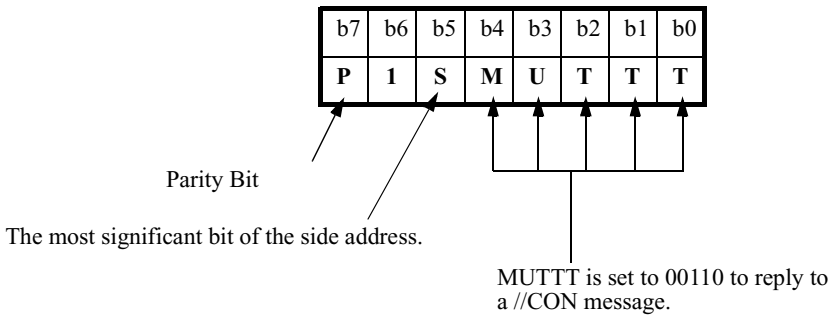


Figure 27. TC1 Character

Figure 28 shows the LA1 structure.

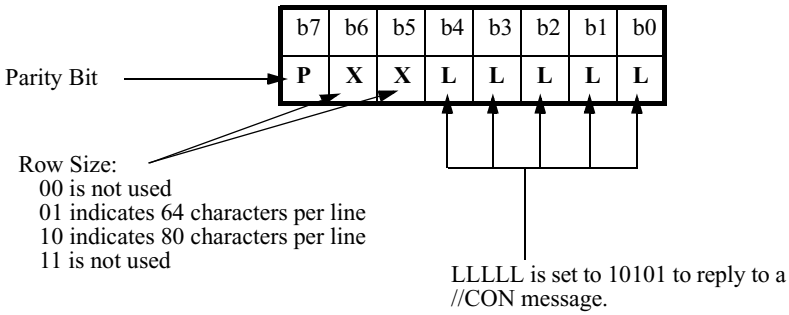


Figure 28. LA1 Character

Data Flow

Introduction

This section describes AC100 data flow.

Message Handling

The AC100 TPAD sends message in two directions:

- to the HPAD
- to the devices

Messages from AC100 devices to the HPAD

All segments sent to the HPAD have a segment number that is appended after the LPC. This segment number is needed for flow control purposes at the HPAD. After the connection has been established, all messages to the HPAD have the format:

Figure 29. Segment Number Appended After Parity Check

The Segment Number can have one of the following values.

- 0 for all first segments in a multi-segment message. This value is for all data messages that are the first of a multi segment message
- 1 for the middle segments in a multi-segment message
- 2 for last segment of a multi-segment message
- 3 for single segment messages. This value is present in normal data segments and the phantom command

When the AC100 TPAD receives a data segment from the devices, it does the following:

- Checks if the STX is present and strips it off.
- Adds the segment number to the end of the segment.
- Forwards the segment to the HPAD based on the Muxsite or Minisite number.

Note

If there is no STX at the start of the segment, the AC100 TPAD discards the segment and generates a report.

The AC100 TPAD looks into the message Header to determine the message type. If the message received is an Extended Envelope, the AC100 TPAD starts a Specific polling cycle to the device that has sent the message.

Messages from HPAD to the AC100 devices

The AC100 TPAD does the following when it receives a data segment from the HPAD.

- Inserts STX at the beginning of the data segment.
- Checks the LPC. If there is a mismatch, it updates the error counter and generates a report.
- Queues the segment for transmission down to the devices.

Error Handling

The AC100 TPAD handles transmission in two ways:

- It drops unrecognized frames;
- It forwards segments with parity or LPC errors.

Frames Discarded

The Frames Discarded Counter is incremented for every segment not recognized by the AC100 TPAD.The AC100 TPAD checks each segment it receives from the devices before it transmits to the HPAD. If the STX at the start of the header is missing, the AC100 TPAD discards the data segment and increments the number of frames discarded counter.

The maximum length of a data segment can be 137 bytes (7 header + 128 data + 2 trailer). The AC100 TPAD generates a report for all segments that contain more than 137 characters before it discards the segment. It will not forward segments that are larger than 137 bytes to the HPAD.

Parity and LPC Checking

AC100 TPAD does not retransmit segments upon error detection. Instead, it forwards erroneous segments (for example, segments with parity and LPC errors) to the HPAD and increments the error counters on the AC100 TPAD.

Buffering

The AC100 TPAD has two kinds of buffers:

- The Transmit Buffer
- The Receive Buffer

Transmit Buffer

The AC100 TPAD maintains a single Transmit Buffer. This buffer holds data segments that AC100 TPAD receives from the HPAD. Data segments stored in the Transmit Buffer are transmitted to the devices under a site.

The Transmit Buffer can hold a maximum of 64 data segments. The blocking threshold of this buffer is 48 segments -- that is, when the number of data segments in the buffer reaches 48, the adjacent X.25 channel is blocked. The unblocking threshold will be 32 -- that is, when the number of data segments in the buffer drops to 32 the adjacent X.25 channel is unblocked. The AC100 TPAD forwards the data segments in the Transmit Buffer to the devices in a First In-First Out (FIFO) manner.

The AC100 TPAD flushes the Transmit Buffer when the Port/Node is booted or the Port is Disabled.

Receive Buffer

The AC100 TPAD maintains one Receive Buffer for every site. When a site responds to a TPAD poll, the response is put into the buffer corresponding to that site.

When the AC100 TPAD establishes a connection with the HPAD, it forwards all the segments in the buffer to the HPAD. These buffers hold a maximum of 32 data segments. Unlike the Transmit Buffer, the Receive Buffer has no blocking and unblocking associated with it. When this buffer is full, the TPAD stops polling that site and starts the Congestion Timer. This buffer is flushed when the Congestion Timer times out.

The AC100 TPAD flushes the Receive Buffer when one of these events takes place:

- the Port/Site is booted or disabled
- the Site goes to the Dead
- expiry of the Congestion Timer
- the number of Call Clears received (from the HPAD) is equal to the configured number of AutoCall Attempts

Special Messages

The AC100 TPAD has no special support for loopback messages. It passes loopback messages transparently to the HPAD.

Configuring an AC100 TPAD

Introduction

The parameters for AC100 TPAD operation appear in two records:

- AC100 Port Record
- AC100 Site Record

Port Parameters

Navigating the CTP

Figure 30 shows the CTP path to the Port Record parameters.

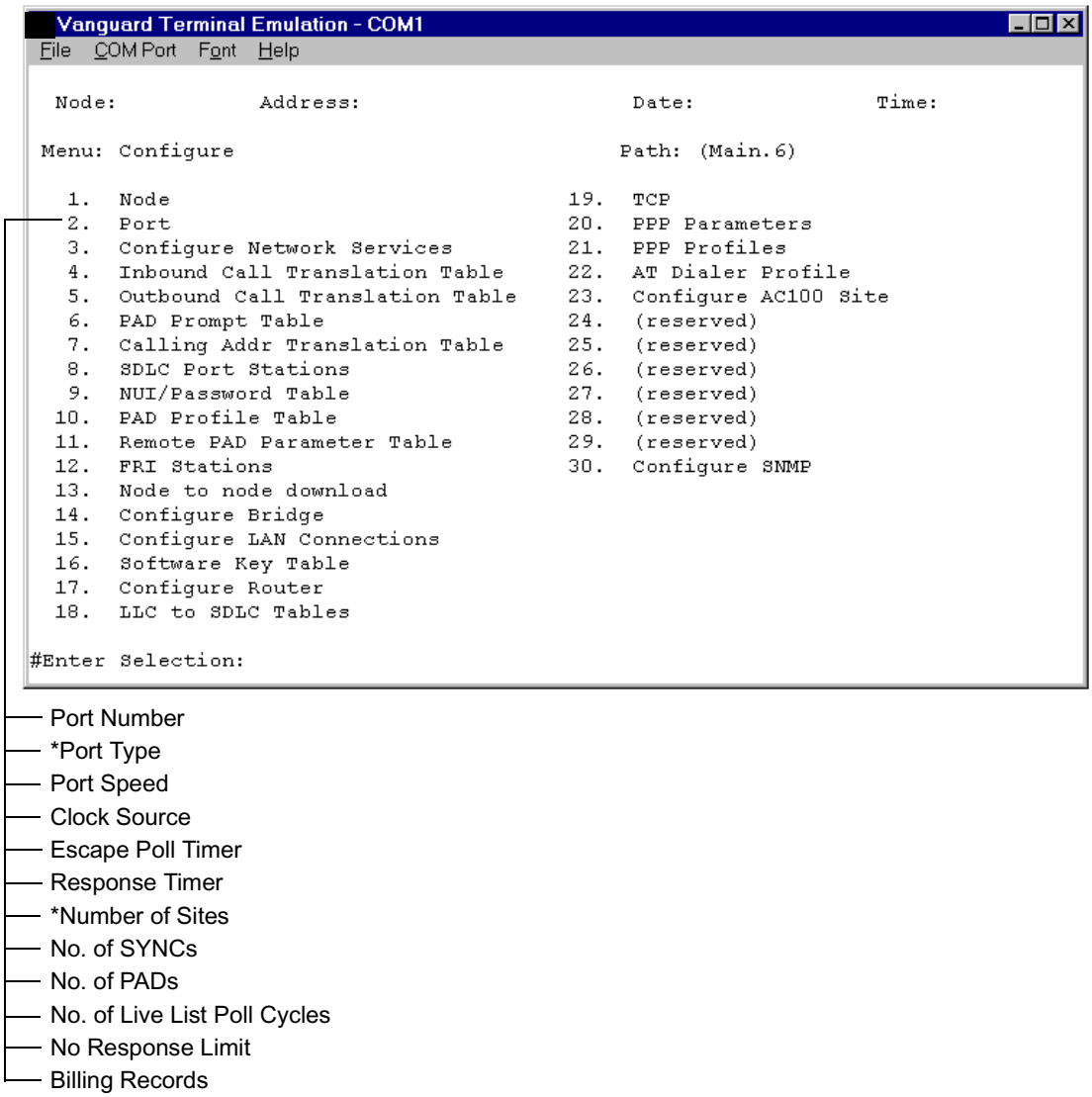


Figure 30. AC100 Port Parameters

Parameters

These parameters are in the Port Record:

Port Number

Range:	Contingent on platform.
Default:	n/a
Description:	Specifies the number of the port which you are configuring.

Port Type

Range:	Contingent on software image.
Default:	n/a
Description:	Specifies the type of port. For this software option, enter AC100.

Port Speed

Range:	2400 to 19200
Default:	4800
Description:	Specifies the speed of the port in bits per second.

Clock Source

Range:	INT, EXT
Default:	EXT
Description:	Specifies the clock source: • INT: Internal clock source • EXT: External clock source

Escape Poll Timer

Range:	50 to 800
Default:	100
Description:	Specifies the amount of time, in milliseconds, between the beginning of transmission to the HPAD and the sending of an Escape Poll. If the Escape poll timer expires and the segment is still being transmitted, the AC100 TPAD inserts the Escape poll sequence in the segment being transmitted and transmit the remaining part of the segment. The Escape poll is only inserted when there is no input in progress. If there is a response being received then the expiry of this timer does not result in an escape poll being inserted in the segment being sent out. **Note** Processing delays may offset the insertion of the Escape poll in the data segment by about 10 - 15%.

Response Timer

Range:	50 to 1000
Default:	250
Description:	Specifies the time, in milliseconds, that an AC100 TPAD waits for a response when it polls a site. The AC100 TPAD port starts the Response Timer and stops it when a response arrives. If the Timer expires before AC100 TPAD receives the response, the AC100 TPAD treats it as no response to the poll.

Number of Sites

Range:	1to 16
Default:	1
Description:	Specifies the number of sites that are connected to this AC100 TPAD. The user is only able to configure the number of sites specified in this parameter on each port. **Note** You must perform a Node boot for changes to this parameter to take affect.

Number of SYNCs

Range:	2, 4, 6
Default:	2
Description:	Specifies the number of SYNC characters that may be sent before the segment is transmitted.

Number of PADs

Range:	1 to 6
Default:	1
Description:	Specifies the number of PAD characters that may be be sent after a segment is transmitted to the site.

Number of Live List Poll Cycles

Range:	1 to 5
Default:	1
Description:	Specifies the number of times the AC100 TPAD must poll all the sites on the Live list before it polls a site from the Dead list. When a AC100 TPAD completes the number of polls cycles specified in this parameter, it polls one Dead site to see if it has been revived.

No Response Limit

Range:	1 to 5
Default:	3
Description:	Specifies the number of consecutive polls the AC100 TPAD sends before it moves a site to the Dead list. The No Response Limit applies to both General and Specific polls.

Billing Records

Range:	ON, OFF
Default:	OFF
Description:	Specifies whether billing (accounting) records are created for calls originating from this port.

Site Parameters

Navigating the CTP

Figure 31 shows the CTP path to the Site Record parameters.

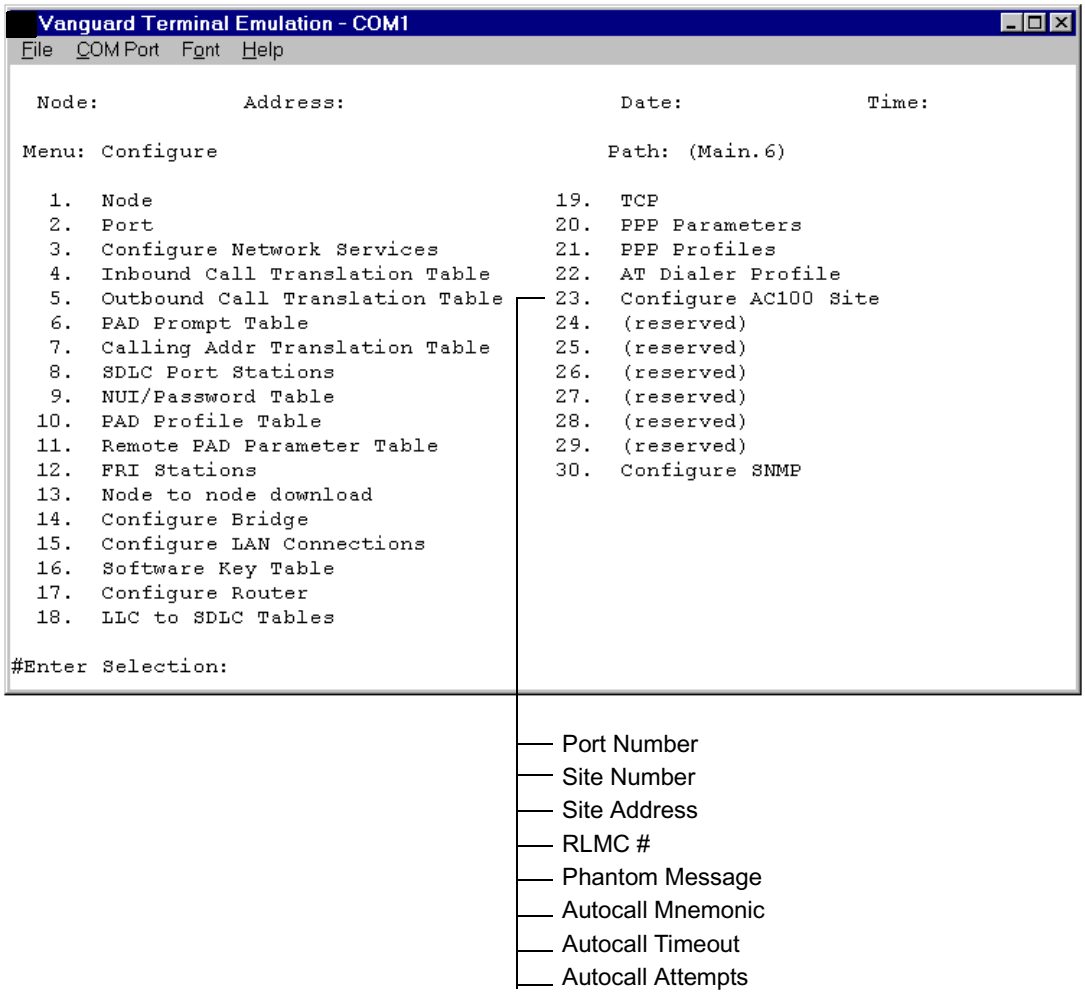


Figure 31. AC100 Site Parameters

Parameters

These parameters are in the Site Record:

Site Address

Range:	0 to 15
Default:	0
Description:	Specifies the address of the site. The type of site (MUX or MINI) depends on the number you assign the site: • Numbers 0 through 6 and 8 through 14 are designated as MUXsites. • Numbers 7 and 15 are designated as MINIsites.

RLMC

Range:	0 to 7
Default:	0
Description:	Specifies the Remote Line Modem Controller (RLMC) number.

Phantom Message

Range:	NO, YES
Default:	NO
Description:	Specifies whether a Phantom message is sent to the HPAD when a connection is established. It indicates to host which path a Mux or Mini is using to send data.

Autocall Mnemonic

Range:	0 to 8 alphanumeric characters
Default:	blank
Description:	Specifies the mnemonic name that is to be used when a call is placed towards the host.

Autocall Timeout

Range:	5 to 255s
Default:	30
Description:	Specifies the time interval in seconds between call attempts.

Autocall Attempts

Range:	0 to 255
Default:	0
Description:	Specifies the number of times the port makes autocall attempts . A value of 0 allows unlimited attempts.

Statistics

Introduction

This section describes the statistics available for AC100 TPAD. You can view these statistics from the CTP menu.

Navigating the CTP

Figure 32 shows how to navigate the CTP and find statistics relevant to AC100 operation.

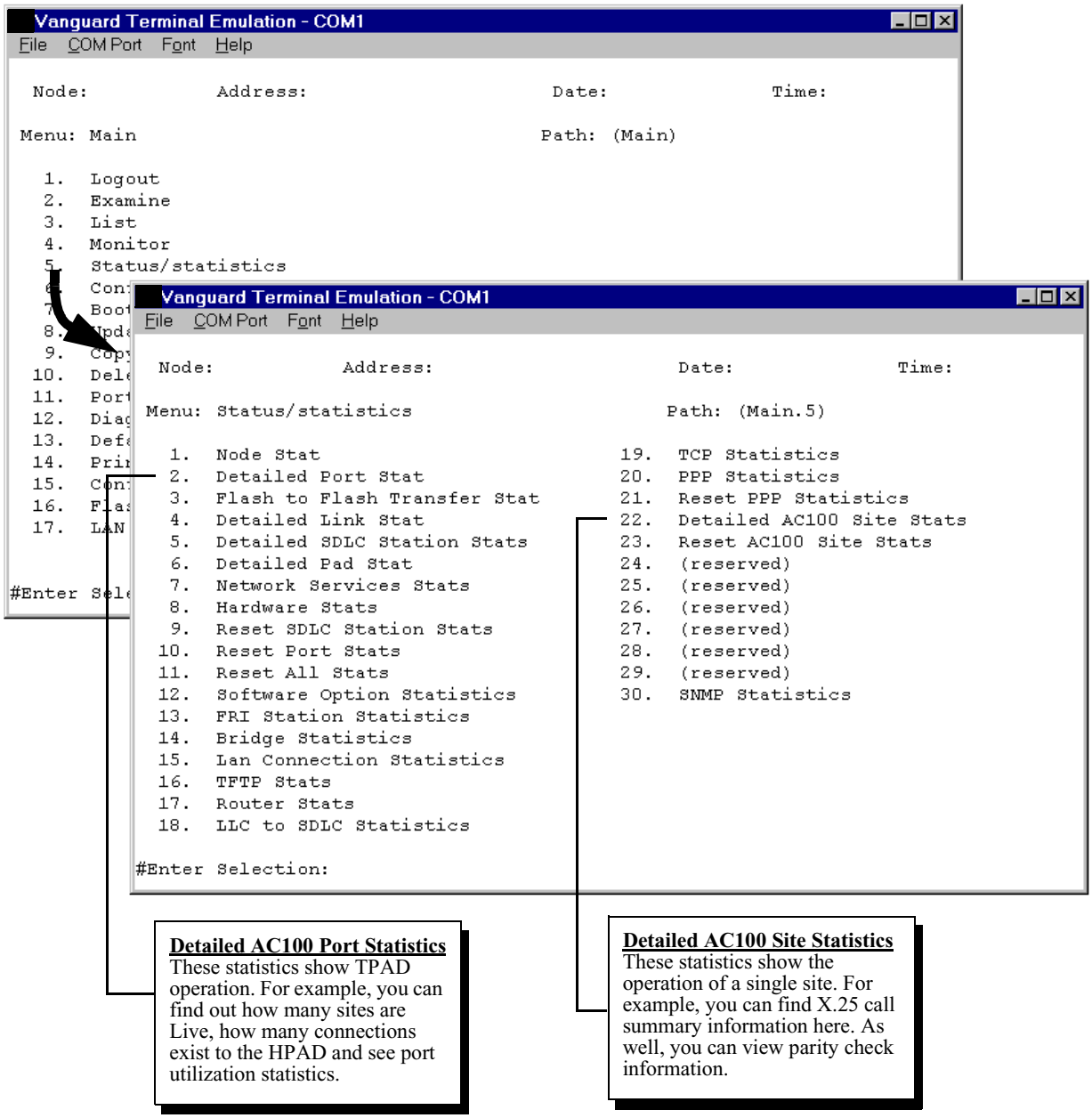


Figure 32. Finding AC100 Statistics

Port Statistics

Introduction

Detailed AC100 port statistics provide the status of port operations.

How To View Detailed Statistics

Follow these steps to view AC100 port statistics..

Step	*Action*
1	Select **Status/Statistics**, from the CTP Main menu.
2	Select **Detailed Port Statistics,** from the Status/Statistics menu.
3	Enter the number of the port that you want statistics on, and press Return.

Detailed Port Statistics

Figure 33 shows an example of detailed AC100 port statistics

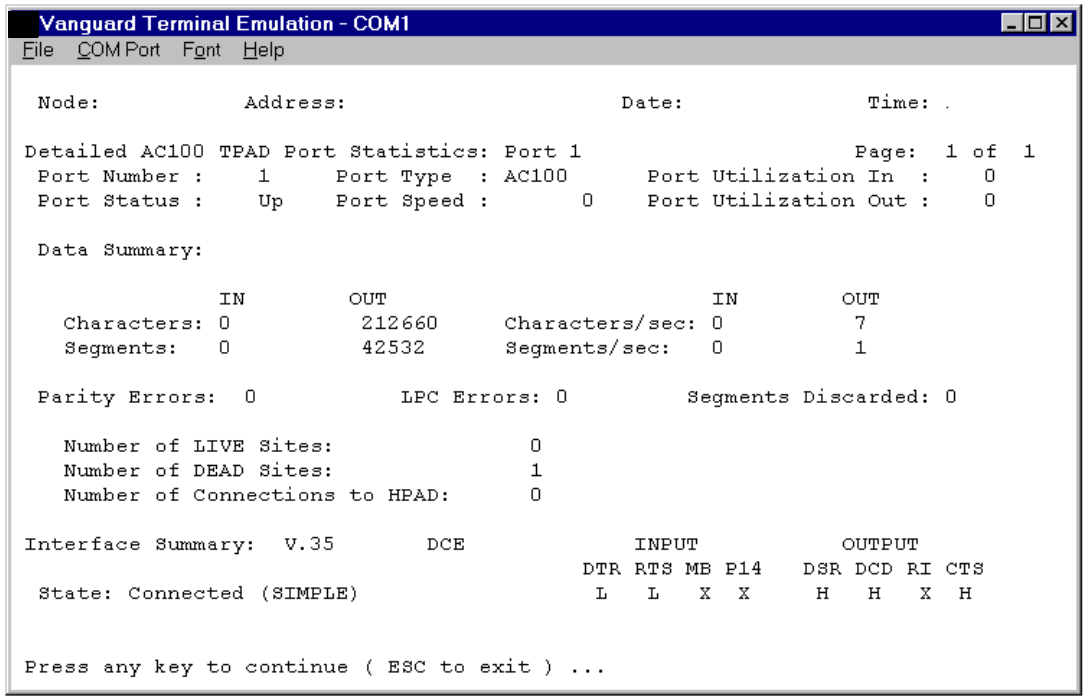


Figure 33. Detailed Port Statistics

Screen Terms

The following table describes the screen terms shown in Figure 34.

Screen Term	Indicates...
Port Number	Physical port number.
Port Status	Operational status of the port. • **Up:** the port is operational. • **Disabled:** the port is not operational.
Port Type	Type of access protocol for this port.
Port Speed	Port speed in bits per second.
Port Utilization In	The port utilization for the line to port direction.
Port Utilization Out	The port utilization for the port to line direction.
Data Summary	**Characters:** Indicates the number of characters received or transmitted since the last boot or statistics reset. **Characters/sec:** Indicates the average number of characters received or transmitted by this port in a second. **Segments:** Indicates the number of segments received or transmitted since the last boot or statistics reset. **Segments/sec:** Indicates the average number of segments received or transmitted by this port in a second. **Parity Errors:** Total number of parity errors received by this port since the last statistics reset. **LPC Errors:** Total number of frames received by this port with LPC errors since the last statistics reset. **Segments Discarded:** Total number of segments discarded, by this port, either due to protocol violation since the last statistics reset. **Number of LIVE Sites:** Total number of live sites connected to this port since the last statistics reset. **Number of DEAD Sites:** Total number of dead sites seen by this port since the last statistics reset. **Number of Connections to HPAD:** Total number of connections to the HPAD since the last statistics reset.

Screen Term	Indicates... (continued)
Interface Summary	State: indicates the current state of EIA signals. For a complete listing of EIA states, refer to the *Vanguard Basic Configuration Manual* (T0113). Input: • DTR (Data Transmit Ready) • RTS (Request To Send) • MB (Make Busy) • P14 (indicates input hardware data restraint) **Note** These signals are monitored by the CTP port. Output: • DSR (Data Set Ready) • DCD (Data Carrier Detect) • RI (Ring Indicator) • CTS (Clear To Send) **Note** These signals are generated by the Vanguard port.

Site Statistics

Introduction

Detailed AC100 site statistics provide the status of site operations.

How To View Detailed Statistics

Follow these steps to view AC100 site statistics.

Step	Action
1	Select **Status/Statistics** from the CTP Main menu.
2	Select S**ite Statistics** from the Status/Statistics menu.
3	Enter the numbers of the port and site that you want statistics on, and press Return.

Site Statistics

Figure 34 shows an example of detailed AC100 site statistics.

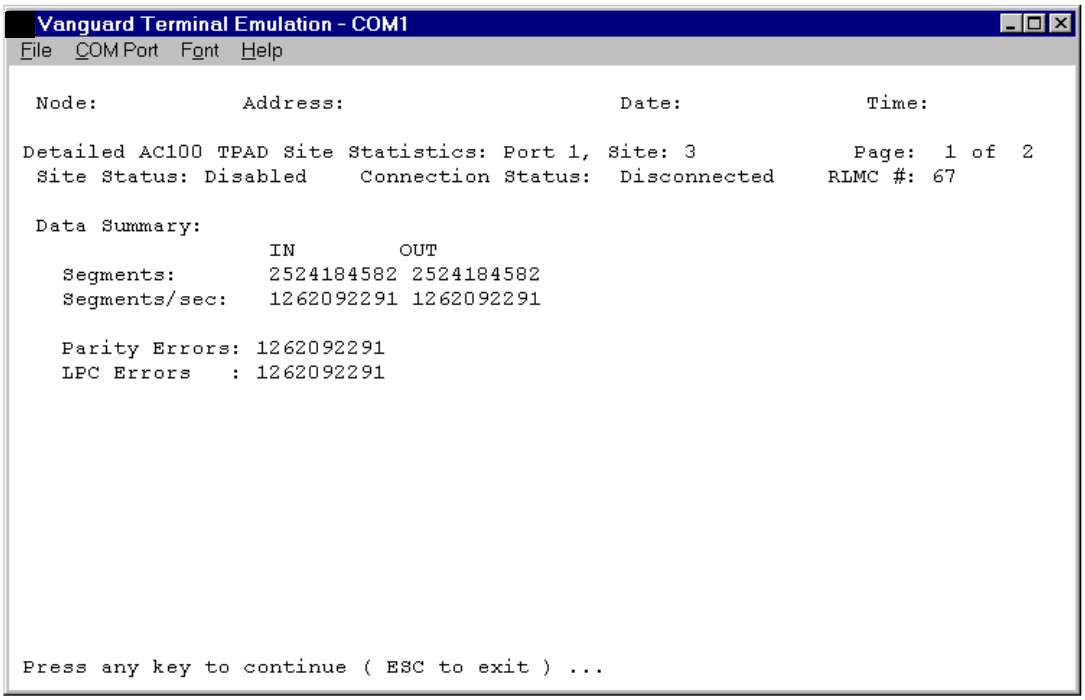


Figure 34. Site Statistics - Page 1 of 2

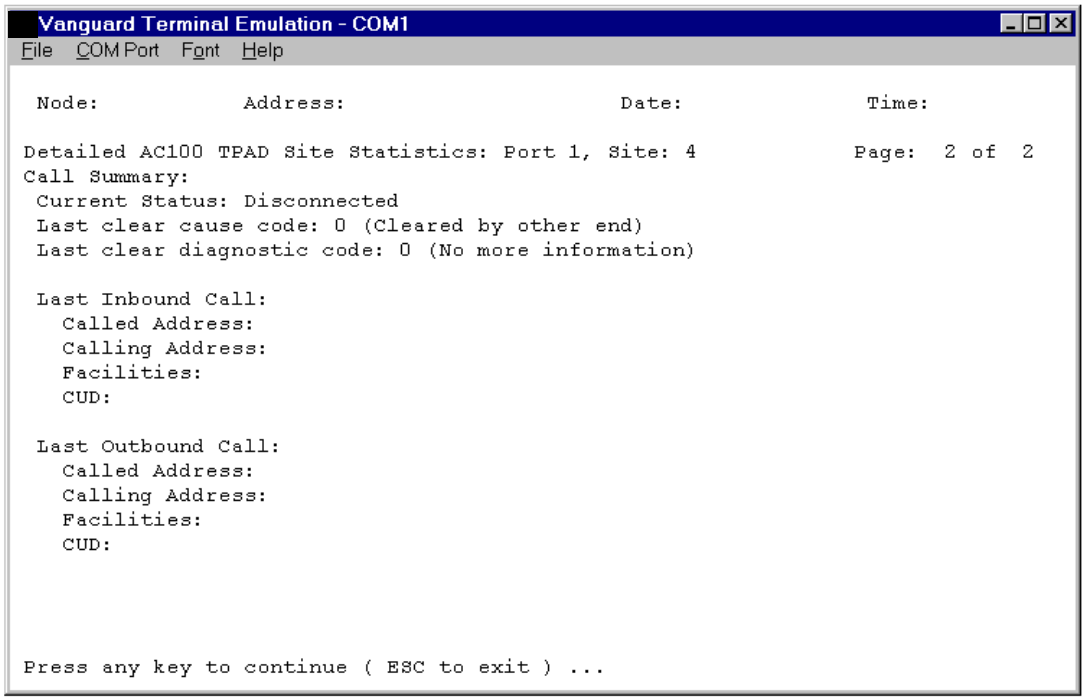


Figure 35. Site Statistics - Page 2 of 2

Screen Terms

This table describes the screen terms shown in Figures 34 and 35.

Screen Term	*Indicates...*
Port Number	Physical port number.
Site Number	Address of this site. The device address will show up only for Minisites.
Site Status	State of the Muxsite or Minisite. • Disabled: when this site is disabled • Live: when this site responds to polls • Dead: when this site has not responded to the number of consecutive polls specified in the No Response Limit parameter. (See “No Response Limit” section on page 30.)
Connection Status	Whether the AC100 TPAD has established a connection to the HPAD for this site. • Connected if a connection for this site has been established with the HPAD • Disconnected otherwise
RMLC	Remote Line Modem Controller number configured by the user. The AC100 TPAD inserts the RLMC number into the call request packet to the HPAD in the CUD field along with the site address.

Screen Term	Indicates... (continued)
Segments	Total number of segments transmitted to and received from this site.
Parity Errors	Total number of parity errors (in the received frames) by this site since the last statistics reset.
LPC Errors	Total number of Longitudinal Parity Check (LPC) errors (in received frames) by this site since the last statistics reset.
Call Summary	Data on calls placed with the HPAD • Current Status: – Calling: when it is awaiting call accept from HPAD – Connected: when the connection to the HPAD has been established – Idle: when connection attempts are not in progress (no data to send to HPAD), or when all autocall attempts have been exhausted or when it is waiting for autocall timeout (to send call request again). • Last Clear Cause Code: the cause code received in the last clear packet. • Last Clear Diagnostic Code: the diagnostic code received in the last clear packet. • Last Inbound Call: the called address, calling address, X.25 facilities and CUD in the last inbound call request packet. • Last Outbound Call: the called address, calling address, X.25 facilities and CUD in the last outbound call request packet sent.

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