

SignalPath™ 201-SA (SP201-SA™) Installation Guide

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SignalPath Software Version 1100

This *Installation Guide* presents a quick, standard installation of the SP201-SA.

Note: The needs of your network may require an installation that varies from the standard installation. For a customized installation, see the *SP201-SA Customization and Maintenance Guide*. For hardware information, see the *SP201-SA Hardware Reference Guide*.

The SP201-SA is available in two versions:

- The two-port SP201-SA, supporting one trunk circuit of up to 30 channel circuits
- The four-port SP201-SA, supporting up to two trunk circuits of up to 30 channel circuits each (for a total of up to 60 channel circuits)

Note: A standard trunk circuit (from one external device, through the SP201-SA, to another external device) comprises trunk connections to two ports. The SignalPath™ configuration software defines each side of the trunk circuit (that is, each connection to a port) as a trunk.

This document uses the term *trunk* to indicate a connection to one port; it uses the term *trunk circuit* to indicate the complete end-to-end connection (over two ports). Using these definitions, a trunk circuit comprises two trunks.

Before you start this installation, be sure you have filled out the worksheet for adding this device to your network. See the *SP201-SA Site Planning Worksheet*.

See the following sections for a standard installation of the SP201-SA:

- [Section A, Physical Installation](#)
- [Section B, Port Configuration](#)
- [Section C, Clocking Configuration](#)
- [Section D, Trunk Configuration](#)
- [Section E, Channel Configuration](#)
- [Section F, SP201-SA Warmstart](#)

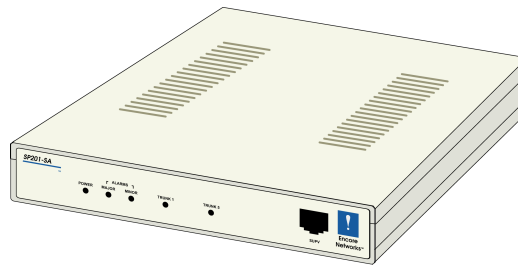


Figure 1. SP201-SA Chassis

Note: The cables you connect to the SP201-SA depend on the protocols. The following table lists the ports and line each protocol uses in this guide's standard installation.

Protocol Group	Protocol	Port on Two-Port SP201-SA	Ports on Four-Port SP201-SA	Line
Channel-Associated Signaling (CAS)	DTMF	1	1, 2	T1
	R1	1	1, 2	T1
	R2	1	1, 2	E1
ISDN	ETSI ISDN	2	3, 4	E1
	NI2 ISDN	2	3, 4	T1

A Physical Installation

1. Place the SP201-SA on a tabletop or shelf.
2. Connect the cables for one set of trunks to the ports on the rear of the SP201-SA chassis, as follows:
 - a For the CAS trunk (DTMF, R1, R2, or N5), do one of the following:
 - ◆ For DTMF or R1, connect a T1 cable to the RJ48C port labeled **Port 1**.
 - or
 - ◆ For R2 or N5, connect an E1 cable in one of the following ways:
 - Connect an E1 cable to the RJ48C port labeled **Port 1**.
 - or
 - Connect an E1 cable to the BNC **Rx** and **Tx** ports labeled **Port 1**.
 - b For the ISDN trunk, do one of the following:
 - ◆ For ETSI ISDN on a two-port SP201-SA, connect an E1 cable to the RJ48C port labeled **Port 2**. (For ETSI ISDN on a four-port SP201-SA, connect an E1 cable to the RJ48C port labeled **Port 3**.)
 - or
 - ◆ For NI2 ISDN on a two-port SP201-SA, connect a T1 cable to the RJ48C port labeled **Port 2**. (For NI2 ISDN on a four-port SP201-SA, connect a T1 cable to the RJ48C port labeled **Port 3**.)

Note: Channels on trunk 1 of the two-port SP201-SA map to channels on trunk 2, and vice versa.

In a standard installation of the four-port SP201-SA, channels on trunk 1 map to channels on trunk 3 (and vice versa), and channels on trunk 2 map to channels on trunk 4 (and vice versa).

3. If you are installing a four-port SP201-SA, connect another set of trunks to ports on the rear of the chassis, as follows:

a For the CAS trunk (DTMF, R1, or R2), do one of the following:

- ◆ For DTMF or R1, connect a T1 cable to the RJ48C port labeled **Port 2**.

or

- ◆ For R2, connect an E1 cable to the RJ48C port labeled **Port 2**.

b For the ISDN trunk, do one of the following:

- ◆ For ETSI ISDN, connect an E1 cable to the RJ48C port labeled **Port 4**.

or

- ◆ For NI2 ISDN, connect a T1 cable to the RJ48C port labeled **Port 4**.

4. Connect the SP201-SA to its external power supply. Then connect the power supply to a power source (a power outlet), and switch the power on.

Note: Shipments within North America include a power cable for connection to the power outlet. For shipments outside North America, contact your distributor for a cable that meets local requirements to connect the power supply to an outlet.

5. Connect an RJ45 cable from the RJ45 Supervisory port of the SP201-SA to the DB9 COM port of a control terminal—for example, a PC. (An RJ45-to-DB9 adapter is included with the cable.)
6. On the control terminal, start a terminal emulation program, such as HyperTerminal. Configure the serial communications for the control terminal as follows:

Baud rate	9600 bps
Data bits	8
Parity	None
Stop bit	1
Flow control	None

- ❖ When communication has been established, you should see the `user>` prompt.

7. If you don't see a prompt, press **Enter** once.

- ❖ The `user>` prompt appears.

Note: After you have connected a local terminal to the SP201-SA device, you can connect a remote terminal to the local terminal and manage the device from a remote location. See the document *Remote Access to SignalPath™ Devices*.

B Port Configuration

What the terminal displays	What you type	What you are configuring																								
<pre>user> List of Valid LIMs 1) 1 E1 120 Ohm/1 E1 120 Ohm 2) 2 T1 100 Ohm/1 E1 120 Ohm 3) 1 T1 100 Ohm/1 T1 100 Ohm 4) 2 T1 100 Ohm/2 T1 100 Ohm 5) 1 E1 120 Ohm/1 T1 100 Ohm 6) 1 E1 120 Ohm/2 T1 100 Ohm 7) 1 T1 100 Ohm/1 E1 75 Ohm 8) 1 T1 100 Ohm/1 E1 120 Ohm 9) 1 E1 75 Ohm/1 T1 100 Ohm 10) 1 E1 75 Ohm/1 E1 75 Ohm > 11) 1 E1 75 Ohm/1 E1 120 Ohm < 12) 1 E1 120 Ohm/1 E1 75 Ohm 13) 2 T1 100 Ohm/2 E1 75 Ohm 14) 2 T1 100 Ohm/2 E1 120 Ohm 15) 2 E1 75 Ohm/2 T1 100 Ohm 16) 2 E1 75 Ohm/2 E1 75 Ohm 17) 2 E1 75 Ohm/2 E1 120 Ohm 18) 2 E1 120 Ohm/2 T1 100 Ohm 19) 2 E1 120 Ohm/2 E1 75 Ohm 20) 2 E1 120 Ohm/2 E1 120 Ohm Enter LIM Choice from list above [1-20] (current=11) ==></pre>	<pre>config lim</pre>	<p>Interfaces for the SP201-SA's ports</p>																								
<p>Select the configuration that supports your SP201-SA's port connections, and press the Enter key. (The List of Valid LIMs shown is for a four-port SP201-SA.)</p> <p>Note: The standard choices shown below, in boldfaced numbers, include 120-ohm E1 interfaces. E1 interfaces may instead use 75 ohms over a BNC connector. If you use BNC connectors, choose an appropriate combination from the List of Valid LIMs above.</p> <table border="1"> <thead> <tr> <th><u>Protocol Conversion</u></th> <th><u>Interfaces</u></th> <th><u>2-Port</u></th> <th><u>4-Port</u></th> </tr> </thead> <tbody> <tr> <td>DTMF-ETSI ISDN</td> <td>T1/E1</td> <td>8</td> <td>14</td> </tr> <tr> <td>DTMF-NI2 ISDN</td> <td>T1/T1</td> <td>3</td> <td>4</td> </tr> <tr> <td>R1-NI2 ISDN</td> <td>T1/T1</td> <td>3</td> <td>4</td> </tr> <tr> <td>R2-ETSI ISDN</td> <td>E1/E1</td> <td>1</td> <td>20</td> </tr> <tr> <td>R2-NI2 ISDN</td> <td>E1/T1</td> <td>5</td> <td>18</td> </tr> </tbody> </table>	<u>Protocol Conversion</u>	<u>Interfaces</u>	<u>2-Port</u>	<u>4-Port</u>	DTMF-ETSI ISDN	T1/E1	8	14	DTMF-NI2 ISDN	T1/T1	3	4	R1-NI2 ISDN	T1/T1	3	4	R2-ETSI ISDN	E1/E1	1	20	R2-NI2 ISDN	E1/T1	5	18		<p>Ports 1 and 2/Ports 3 and 4</p>
<u>Protocol Conversion</u>	<u>Interfaces</u>	<u>2-Port</u>	<u>4-Port</u>																							
DTMF-ETSI ISDN	T1/E1	8	14																							
DTMF-NI2 ISDN	T1/T1	3	4																							
R1-NI2 ISDN	T1/T1	3	4																							
R2-ETSI ISDN	E1/E1	1	20																							
R2-NI2 ISDN	E1/T1	5	18																							
<pre>(A message similar to the following appears only if you change the LIM configuration.) LIM set to: 2 E1 120 Ohm/2 E1 120 Ohm A coldstart is required for this change to take effect Do you wish to reset now (y/n)?</pre>	<pre>y (You must do this now, so that subsequent configuration parameters will reflect the SP201-SA's port configuration.)</pre>	<p>Implementation of port configuration</p>																								

What the terminal displays	What you type	What you are configuring
(Information on tests and restarts) (Boot banner and boot> prompt) (Initializations) (Application banner and user> prompt)	<i>(Do not type anything. The application will load in a few seconds.)</i>	 (When you see the user> prompt, the SP201-SA is ready for further configuration.)

C Clocking Configuration

What the terminal displays	What you type	What you are configuring
user>	config clocks	Clocking (synchronization) for the SP201-SA
Enter the trunk number [1-4] from which this card is to derive its clock source. Or enter "0" if this card is to use its internal clock. The PRIMARY clock source is derived from (current = INTERNALCLOCK):	1	Clock sourced from the device connected to the remote end of the R2 trunk
The SECONDARY clock source is derived from (current = INTERNALCLOCK):	0	Backup clock sourced from the SP201-SA
user>		(Clocking has been configured.)

D Trunk Configuration

Perform the following procedure once for each trunk on the SP201-SA.

What the terminal displays	What you type	What you are configuring
user>	config framer p <i>where p is the port number (1, 2, 3, or 4)</i>	Trunk on port p
WARNING: Configuring framers will cause LOSS of calls!!!!!!! Do you wish to proceed anyway (Y/N) :	y	
<i>For a T1 line:</i> LIM type: 2 T1 100 Ohm/2 E1 120 Ohm 1 D4 SF 2 D4 ESF enter T1 frame type (currently D4 SF):	<i>For T1 lines: 1 or your T1 frame type)</i>	Frame type for trunk
<i>For an E1 line:</i> LIM type: 2 E1 120 Ohm/2 E1 120 Ohm 1 G704 CRC 2 G704 noCRC 3 G704 MF CRC 4 G704 MF noCRC enter E1 frame type (currently G704 MF no CRC):	<i>For E1 lines: 3 (or your E1 frame type)</i>	
<i>For T1 lines:</i> line coding type choices are: 1 AMI 2 B8ZS enter line coding type (currently B8ZS) :	<i>For T1 lines: 2 (or your T1 line coding)</i>	Line coding for trunk
<i>For E1 lines:</i> line coding type choices are: 1 AMI 2 HDB3 enter line coding type (currently HDB3) :	<i>For E1 lines: 2 (or your E1 line coding)</i>	
<i>For T1 lines:</i> line length choices are: 1 0 to 115 feet 2 82 to 213 feet 3 180 to 312 feet 4 279 to 410 feet 5 377 to 509 feet 6 476 to 607 feet 7 574 to 689 feet enter line length (currently 0-115 feet):	1 <i>(or your T1 cable length)</i>	T1 cable length
user >		(The trunk has been configured.)

E Channel Configuration

See the following sections to configure the protocols in your SP201-SA:

- DTMF signaling [Section E.1, Channel Configuration for DTMF Signaling](#)
- R1 signaling [Section E.2, Channel Configuration for R1 Signaling](#)
- R2 signaling [Section E.3, Channel Configuration for R2 Signaling](#)
- N5 signaling [Section E.4, Channel Configuration for N5 Signaling](#)
- ETSI ISDN signaling [Section E.5, Channel Configuration for ETSI ISDN](#)
- NI2 ISDN signaling [Section E.6, Channel Configuration for NI2 ISDN](#)

E.1 Channel Configuration for DTMF Signaling

What the terminal displays	What you type	What you are configuring
user>	config dt all	All DTMF channels
Set 1/1 thru 2/31 out-of-service? (y or n) : <current=n>	n	Placement of channels 1–31 of trunk 1 and (on the four-port SP201-SA) channels 1–31 of trunk 2 into service
DTMF Caller ID/ANI used? (y or n) : <current=n>	y (or n if caller ID is not required)	Request for caller identification
Other modifications? : (y or n) : <current=n>	n	Completion of standard configuration for DTMF signaling (If you wish to configure other parameters for DTMF signaling, type y . Then refer to the <i>SP201-SA Customization and Maintenance Guide</i> .)
user>		(DTMF signaling has been configured.)

E.2 Channel Configuration for R1 Signaling

What the terminal displays	What you type	What you are configuring
user>	config r1 all	All R1 channels
Set 1/1 thru 2/31 out-of-service? (y or n) : <current=n>	n	Placement of channels 1–31 of trunk 1 and (on the four-port SP201-SA) channels 1–31 of trunk 2 into service
Template # for default IAM ? : (range 1 - 5) : <current=1>	1	Use of R1 IAM template 1
Template # for default ACM ? : (range 1 - 5) : <current=1>	1	Use of R1 ACM template 1
Include Feature Group D (caller ID/ ANI)? (y or n) : <current=n>	y (or n if caller ID is not required)	Request for caller identification
<i>(The following four questions appear only if you answered y to the previous question.)</i>		
Use 911-Operator Services Signaling (y or n) : <current=n>	n	No use of 911 support
Max nbr of ANI digits to send R1 (0 = all) ? : (range 0 - 32) : <current=0>	0 (zero)	Support for ANI of any size
Are Information digits supported? (y or n) : <current=n>	n	No support of Information digits
Separate Wink required for B-Party Number? (y or n) : <current=n>	n	No separate wink for B-Party
Require wink at end of selection? (y or n) : <current=n>	n	No wink required at end of selection
Generate ringback tone for R1 originated calls? (y or n) : <current=n>	n	No ringback generated for caller
user>		(Standard configuration for R1 signaling has been completed. If you wish to configure other parameters for R1 signaling, refer to the SP201-SA Customization and Maintenance Guide.)

E.3 Channel Configuration for R2 Signaling

What the terminal displays	What you type	What you are configuring
user>	config r2 all	All R2 channels
Set 1/1 thru 2/31 out-of-service? (y or n) : <current=n>	n	Placement of channels 1–31 of trunk 1 and (on the four-port SP201-SA) channels 1–31 of trunk 2 into service
Select R2 converter mode :		
< 1> CCITT	<14>Israel	
< 2> Argentina	<15>Korea	
< 3> Brazil	<16>Kuwait	
< 4> Brazil-Emb	<17>Malaysia	
< 5> Chile	<18>Mexico	
< 6> China	<19>New Zealand	
< 7> Columbia	<20>Paraguay	
< 8> Columbia-Bts	<21>Philippines	
< 9> Columbia-Ngt	<22>Singapore	
<10> Costa Rica	<23>Thailand	
<11> Ecuador	<24>Uruguay	
<12> Greece	<25>Venezuela	
<13> Indonesia		
Outgoing R2 converter mode? (1-25; current=CCITT) :	1 (or <i>your country code</i>)	The country code for the version of R2 signaling this SP201-SA will use
Request R2 caller ID? (y or n) : <current=n>	y (or <i>n if caller ID is not required</i>)	Request for caller identification
Send I15 to R2 side at end of address (vs timeout)? (y or n) : <current=y>	y (or <i>n, depending on your requirement</i>)	Sending an Address Complete code (An answer of n causes the adjacent switch to wait for the appropriate timer to expire before processing the call.)
Other modifications? : (y or n) : <current=n>	n	Completion of standard configuration for R2 signaling (If you wish to configure other parameters for R2 signaling, type y . Then refer to the <i>SP201-SA Customization and Maintenance Guide</i> .)
user>		(R2 signaling has been configured.)

E.4 Channel Configuration for N5 Signaling

What the terminal displays	What you type	What you are configuring
user>	config n5 all	All N5 channels
Set 1/1 thru 2/31 out-of-service? (y or n) : <current=n>	n	Placement of channels 1–31 of trunk 1 and (on the four-port SP201-SA) channels 1–31 of trunk 2 into service
Destination country code for calls to N5 (current) : Enter up to 3 digits:	<i>(your country code)</i>	Your country's international dialing code
Transit calls to N5 enabled ? (y or n) : <current=n>	n	Disallowance of transit traffic
Use Calling Party Category to set N5 language digit? (y or n) : <current=n>	n	No use of the calling party category to derive the language digit
N5 side outgoing language digit (current) : Enter up to 1 digits:	<i>(Press Enter to leave this field empty.)</i>	The fixed language digit for calls originating from the N5 side
Prefix to be stripped from digits before sending to N5 (current) : Enter up to 3 digits:	<i>(Press Enter to leave this field empty.)</i>	Digits to remove from the front of the country code
Digits that cause C11 to be sent to N5 (current) : Enter up to 18 digits:	<i>(Press Enter to leave this field empty.)</i>	Digit string that causes the C11 operator code to be sent to N5
Digits that cause C12 to be sent to N5 (current) : Enter up to 18 digits:	<i>(Press Enter to leave this field empty.)</i>	Digit string that causes the C12 operator code to be sent to N5
Language digit expected from N5 [* = any] (current) : Enter up to 1 digits:	<i>(Press Enter to leave this field empty.)</i>	Acceptance of calls only with a specific language digit (if entered)
Transit calls FROM N5 enabled ? (y or n) : <current=n>	n	Rejection of transit calls (by returning a busy flash)
Digits to prepend in non-transit calls coming from N5 (current) : Enter up to 3 digits:	<i>(Press Enter to leave this field empty.)</i>	Digits to prepend to non-transit calls
Use calling party category from template ? (y or n) : <current=n>	n	Derivation of the Calling Party Category from the N5 language digit
Digits to send when C11 is received from N5 (current) : Enter up to 18 digits:	<i>(Press Enter to leave this field empty.)</i>	The digit string to send when the C11 operator code is received from N5
Digits to send when C12 is received from N5 (current) : Enter up to 18 digits:	<i>(Press Enter to leave this field empty.)</i>	The digit string to send when the C12 operator code is received from N5

What the terminal displays	What you type	What you are configuring
Template # for default IAM ? : (range 1 - 5) : <current=1>	1	Default values for IAM parameters required on the SS7 side but not specified by the N5 protocol
Template # for default ACM ? : (range 1 - 5) : <current=1>	1	Default values for ACM parameters required on the SS7 side but not specified by the N5 protocol
Use user-defined caller ID (ANI) in calls from N5? (y or n) : <current=n>	n	No support of caller ID (ANI). Note: Although N5 does not use ANI, some networks require ANI in all calls. Answering y here places a fixed ANI in each call originating from N5.
Generate ringback tone for N5 originated calls? (y or n) : <current=n>	n	No ringback generation by SignalPath for calls from N5 device
user>		(This completes standard configuration of N5 signaling. If you wish to customize the configuration of N5 signaling, refer to the <i>SP201-SA Customization and Maintenance Guide</i> .)

E.5 Channel Configuration for ETSI ISDN

In the two-port SP201-SA, perform the following procedure once for trunk 2. In the four-port SP201-SA, perform the procedure once each for trunks 3 and 4.

Note: If you are performing this procedure on a two-port SP201-SA, read trunk 3 as trunk 2.

What the terminal displays	What you type	What you are configuring																					
user>	config dchans	ISDN signaling channel																					
<p>The following is the present Trunk configuration. If a change to the Timeslot or Interface Type is desired Enter the Trunk number you wish to modify or exit:</p>																							
<table border="1"> <thead> <tr> <th>Trunk</th> <th>Signaling Type</th> <th>Timeslot</th> <th>Trunk Type</th> <th>Link State</th> <th>Interface Type</th> <th>Protocol</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>D</td> <td>16</td> <td>E1</td> <td>Inactive</td> <td>Network</td> <td>ETSI ISDN</td> </tr> <tr> <td>4</td> <td>D</td> <td>16</td> <td>E1</td> <td>Inactive</td> <td>Network</td> <td>ETSI ISDN</td> </tr> </tbody> </table>			Trunk	Signaling Type	Timeslot	Trunk Type	Link State	Interface Type	Protocol	3	D	16	E1	Inactive	Network	ETSI ISDN	4	D	16	E1	Inactive	Network	ETSI ISDN
Trunk	Signaling Type	Timeslot	Trunk Type	Link State	Interface Type	Protocol																	
3	D	16	E1	Inactive	Network	ETSI ISDN																	
4	D	16	E1	Inactive	Network	ETSI ISDN																	
ISDN Trunk Number	p <i>where p is the port number (3 or 4)</i>	ISDN trunk p																					
Enter value(3 - 4) or "exit" :																							
Select interface type - user(0) or network(1) : <current=1>	1 (or 0)	SP201-SA as the Network role (or as the User role) in this ISDN connection																					
ISDN Interface number 1 assigned to Trunk p, with a D Channel on timeslot 16. Change ISDN Signaling Channel																							
Enter value(1 - 31; current="16") or "exit" :	16	Signaling timeslot																					
<i>(The following message appears only if you change the channel number used as the signaling timeslot.)</i> Changes applied The card must be reset for the changes to operate properly Do you wish to reset now (y/n)?	n	Delay in implementation of changes until performing a warmstart (described in Section F, SP201-SA Warmstart)																					
not resetting... user>		(ISDN signaling has been configured on this trunk.)																					

E.6 Channel Configuration for NI2 ISDN

In the two-port SP201-SA, perform the following procedure once for trunk 2. In the four-port SP201-SA, perform the procedure once each for trunks 3 and 4.

Note: If you are performing this procedure on a two-port SP201-SA, read trunk 3 as trunk 2.

What the terminal displays	What you type	What you are configuring				
user>	config dchans	ISDN signaling channel				
<p>The following is the present Trunk configuration.</p> <p>If a change to the Timeslot or Interface Type is desired</p> <p>Enter the Trunk number you wish to modify or exit:</p>						
Trunk	Signaling Type	Timeslot	Trunk Type	Link State	Interface Type	Protocol

3	D	24	T1	Inactive	Network	NI2 ISDN
4	D	24	T1	Inactive	Network	NI2 ISDN
ISDN Trunk Number	p					
Enter value(3 - 4) or "exit" :	<i>where p is the port number (3 or 4)</i>	ISDN trunk p				
Select interface type - user(0) or network(1) : <current=1>	1 (or 0)	SP201-SA as the Network role (or as the User role) in this ISDN connection				
ISDN Interface number 1 assigned to Trunk p, with a D Channel on timeslot 24.						
Change ISDN Signaling Channel						
Enter value(1 - 31; current="24") or "exit" :	24	Signaling timeslot				
<i>(The following message appears only if you change the channel number used as the signaling timeslot.)</i>						
Changes applied						
The card must be reset for the changes to operate properly						
Do you wish to reset now (y/n)?	n	Delay in implementation of changes until performing a warmstart (described in Section F, SP201-SA Warmstart)				
not resetting...						
user>		(ISDN signaling has been configured on this trunk.)				

F SP201-SA Warmstart

What the terminal displays	What you type	What you are configuring
user>	warmstart	Implementation of the ISDN configuration
This action will drop any calls that are in progress. Do you really want to continue? (y/n):	y	
(Information on tests and restarts)		
(Boot banner)		
boot>	<i>(Do not type anything. The application will load in a few seconds.)</i>	
(Initializations)		
(Application banner)		
user>		(When you see the user> prompt, the SP201-SA is ready for use.)

This completes the standard installation. To configure other parameters, see the *SP201-SA Customization and Maintenance Guide*. For hardware specifications, see the *SP201-SA Hardware Reference Guide*.