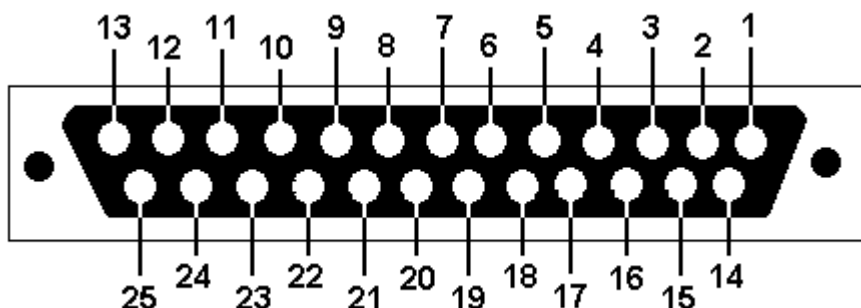


Telex Radio Dispatch System Integration

IP-223 Quick Reference

Notes

IP-223 DB-25 Radio Connector Pinout



PIN #	Signal	Cable Color
1	PTT Relay N.C.	Brown
2	PTT Relay Common	Red
3	MON Relay N.O.	Orange
4	Relay 1 N.C.	Pink
5	Relay 1 Common	Yellow
6	Relay 2 N.O.	Green
7	Ground	Lt Green
8	Digital I/O 0 or Cross Mute	Blue
9	Digital I/O 2	Violet
10	Digital I/O 4	Grey
11	CTCSS or Recorder Out	White
12	Radio RX(-) input / 4-Wire RX	Black
13	Radio TX(-) out / 4-Wire TX or 2-Wire	Brown/White
14	PTT Relay N.O.	Red/White
15	MON Relay N.C.	Red/Black
16	MON Relay Common	Orange/White
17	Relay 1 N.O.	Orange/Black
18	Relay 2 N.C.	Pink/Black
19	Relay 2 Common	Yellow/Black
20	Digital I/O 6 or COR	Green/White
21	Digital I/O 1 or Supervisor	Green/Black
22	Digital I/O 3	Blue/White
23	Digital I/O 5 or Local PTT	Violet/White
24	Radio RX(+) input / 4-Wire RX	Grey/Black
25	Radio TX(+) out / 4-Wire TX or 2-Wire	Black/White
Shield	Ground	

IP-223 DB-9 Connector Pinout

Serial Connector

The Serial connector (DB9) is used for either of the following:

- Programming an initial IP Address into the IP-223 unit, if the IP Address cannot be programmed through the Ethernet port on the installed system.

NOTE: The jumper setting must be RS-232, to communicate with HyperTerminal.

- Providing serial communication to various radios. Both radio 1 and radio 2 are supported on this connector, with the appropriate splitter cable.

NOTE: You must adjust the position of the jumper, on J35 when using line 1, or on J26 when using line 2, according to the serial connection type for the radio interface shown below. For more information, see "Jumper Positions" on page 27.

TABLE 2. Jumper Position

Jumper position	Connection type
A	RS-232
B	TTL

TABLE 3. DB9 Pinout

SERIAL DB9 PINOUT		
SIGNAL	LINE #	DB9 PIN #
TX 232	1	2
RX 232	1	3
TX TTL	1	9
RX TTL	1	1
Ground	both	5
TX 232	2	8
RX 232	2	7
TX TTL	2	4
RX TTL	2	6

IP-223 CTCSS Frequency Codes

Tone Number	Freq. (Hz)	Tone Number	Freq. (Hz)	Tone Number	Freq. (Hz)	Tone Number	Freq. (Hz)
1	33.0	17	71.9	33	123.0	49	183.5
2	35.4	18	74.4	34	127.3	50	186.2
3	36.6	19	77.0	35	131.8	51	189.9
4	37.9	20	79.7	36	136.5	52	192.8
5	39.6	21	82.5	37	141.3	53	196.6
6	44.4	22	85.4	38	146.2	54	199.5
7	47.5	23	88.5	39	151.4	55	203.5
8	49.2	24	91.5	40	156.7	56	206.5
9	51.2	25	94.8	41	159.8	57	210.7
10	53.0	26	97.4	42	162.2	58	218.1
11	54.9	27	100.0	43	165.5	59	225.7
12	56.8	28	103.5	44	167.9	60	229.1
13	58.8	29	107.2	45	171.3	61	233.6
14	63.0	30	110.9	46	173.8	62	241.8
15	67.0	31	114.8	47	177.3	63	250.3
16	69.4	32	118.8	48	179.9	64	254.1

IP-223 Digital Output Codes

Digital Output Table

TABLE 16. Digital Output Values

Value	DIG6	DIG5	DIG4	DIG3	DIG2	DIG1	DIG0
0	L	L	L	L	L	L	L
1	L	L	L	L	L	L	H
2	L	L	L	L	L	H	L
3	L	L	L	L	L	H	H
4	L	L	L	L	H	L	L
5	L	L	L	L	H	L	H
6	L	L	L	L	H	H	L
7	L	L	L	L	H	H	H
8	L	L	L	H	L	L	L
9	L	L	L	H	L	L	H
10	L	L	L	H	L	H	L
11	L	L	L	H	L	H	H
12	L	L	L	H	H	L	L
13	L	L	L	H	H	L	H
14	L	L	L	H	H	H	L
15	L	L	L	H	H	H	H
16	L	L	H	L	L	L	L
17	L	L	H	L	L	L	H
18	L	L	H	L	L	H	L
19	L	L	H	L	L	H	H
20	L	L	H	L	H	L	L
21	L	L	H	L	H	L	H
22	L	L	H	L	H	H	L
23	L	L	H	L	H	H	H
24	L	L	H	H	L	L	L
25	L	L	H	H	L	L	H
26	L	L	H	H	L	H	L
27	L	L	H	H	L	H	H
28	L	L	H	H	H	L	L
29	L	L	H	H	H	L	H
30	L	L	H	H	H	H	L
31	L	L	H	H	H	H	H
32	L	H	L	L	L	L	L
33	L	H	L	L	L	L	H

TABLE 16. Digital Output Values

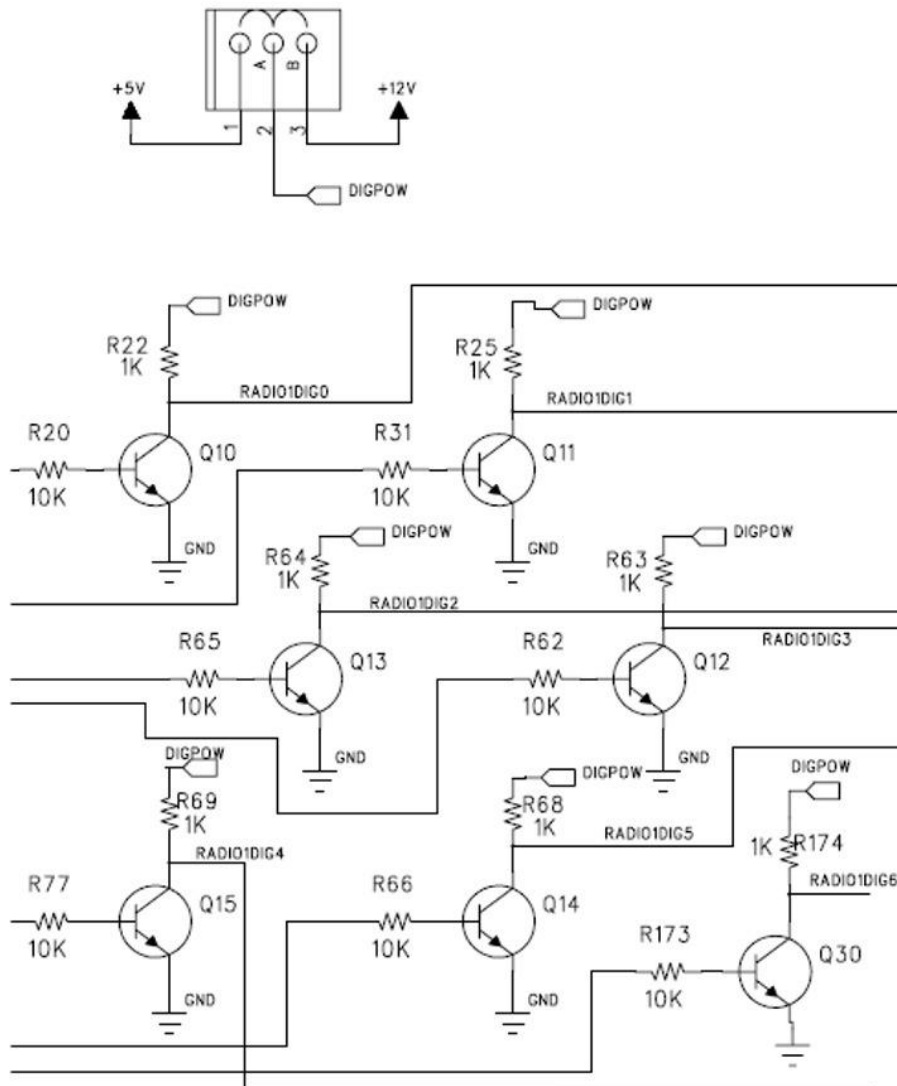
Value	DIG6	DIG5	DIG4	DIG3	DIG2	DIG1	DIG0
34	L	H	L	L	L	H	L
35	L	H	L	L	L	H	H
36	L	H	L	L	H	L	L
37	L	H	L	L	H	L	H
38	L	H	L	L	H	H	L
39	L	H	L	L	H	H	H
40	L	H	L	H	L	L	L
41	L	H	L	H	L	L	H
42	L	H	L	H	L	H	L
43	L	H	L	H	L	H	H
44	L	H	L	H	H	L	L
45	L	H	L	H	H	L	H
46	L	H	L	H	H	H	L
47	L	H	L	H	H	H	H
48	L	H	H	L	L	L	L
49	L	H	H	L	L	L	H
50	L	H	H	L	L	H	L
51	L	H	H	L	L	H	H
52	L	H	H	L	H	L	L
53	L	H	H	L	H	L	H
54	L	H	H	L	H	H	L
55	L	H	H	L	H	H	H
56	L	H	H	H	L	L	L
57	L	H	H	H	L	L	H
58	L	H	H	H	L	H	L
59	L	H	H	H	L	H	H
60	L	H	H	H	H	L	L
61	L	H	H	H	H	L	H
62	L	H	H	H	H	H	L
63	L	H	H	H	H	H	H
64	H	L	L	L	L	L	L
65	H	L	L	L	L	L	H
66	H	L	L	L	L	H	L
67	H	L	L	L	L	H	H
68	H	L	L	L	H	L	L
69	H	L	L	L	H	L	H
70	H	L	L	L	H	H	L
71	H	L	L	L	H	H	H

IP-223 Digital Output Codes

Value	DIG6	DIG5	DIG4	DIG3	DIG2	DIG1	DIG0
72	H	L	L	H	L	L	L
73	H	L	L	H	L	L	H
74	H	L	L	H	L	H	L
75	H	L	L	H	L	H	H
76	H	L	L	H	H	L	L
77	H	L	L	H	H	L	H
78	H	L	L	H	H	H	L
79	H	L	L	H	H	H	H
80	H	L	H	L	L	L	L
81	H	L	H	L	L	L	H
82	H	L	H	L	L	H	L
83	H	L	H	L	L	H	H
84	H	L	H	L	H	L	L
85	H	L	H	L	H	L	H
86	H	L	H	L	H	H	L
87	H	L	H	L	H	H	H
88	H	L	H	H	L	L	L
89	H	L	H	H	L	L	H
90	H	L	H	H	L	H	L
91	H	L	H	H	L	H	H
92	H	L	H	H	H	L	L
93	H	L	H	H	H	L	H
94	H	L	H	H	H	H	L
95	H	L	H	H	H	H	H
96	H	H	L	L	L	L	L
97	H	H	L	L	L	L	H
98	H	H	L	L	L	H	L
99	H	H	L	L	L	H	H
100	H	H	L	L	H	L	L
101	H	H	L	L	H	L	H
102	H	H	L	L	H	H	L
103	H	H	L	L	H	H	H
104	H	H	L	H	L	L	L
105	H	H	L	H	L	L	H
106	H	H	L	H	L	H	L
107	H	H	L	H	L	H	H
108	H	H	L	H	H	L	L
109	H	H	L	H	H	L	H
110	H	H	L	H	H	H	L
111	H	H	L	H	H	H	H
112	H	H	H	L	L	L	L
113	H	H	H	L	L	L	H
114	H	H	H	L	L	H	L
115	H	H	H	L	L	H	H
116	H	H	H	L	H	L	L

Value	DIG6	DIG5	DIG4	DIG3	DIG2	DIG1	DIG0
117	H	H	H	L	H	L	H
118	H	H	H	L	H	H	L
119	H	H	H	L	H	H	H
120	H	H	H	H	L	L	L
121	H	H	H	H	L	L	H
122	H	H	H	H	L	H	L
123	H	H	H	H	L	H	H
124	H	H	H	H	H	L	L
125	H	H	H	H	H	L	H
126	H	H	H	H	H	H	L
127	H	H	H	H	H	H	H
128	Previous digital output values are used.						

IP-223 Digital Output Pull-up Voltage Settings



The Digit0-Digit6 outputs are open collector transistor switches to ground, with a +5v or +12v sourced 1kohm pull-up resistor. The ground reference is to pin 7 on the DB-25 connector. The pull-up voltage is set by jumper inside the IP-223 (J8 for Radio 1, J30 for Radio 2), and can be different on each radio port.

Digit0, Digit1, Digit5, and Digit6 are shared input/output. Input functions are mapped as follows; Digit0-Local XMute, Digit1-Local Supervisory, Digit5-Local PTT, Digit6-Local COR.

IP-223 Tone Paging Frequencies

Tone Number	Code Digit	European Tone Frequencies in Hz												Motorola	
		ZVEI	ZVEI2	KEN	PZVEI	DZVEI	PDZVEI	CCIR1	CCIR2	PCCIR	EEA	EURO SIGNAL	NATEL	EIA	MODAT
TONE 0	0	2400	2400	815	2400	2200	2200	1981	1981	1981	1981	979.8	1633	600	637.5
TONE 1	1	1060	1060	882	1060	970	970	1124	1124	1124	1124	903.1	631	741	787.5
TONE 2	2	1160	1160	954	1160	1060	1060	1197	1197	1197	1197	832.5	697	882	937.5
TONE 3	3	1270	1270	1032	1270	1160	1160	1275	1275	1275	1275	767.4	770	1023	1087.5
TONE 4	4	1400	1400	1117	1400	1270	1270	1358	1358	1358	1358	707.4	852	1164	1237.5
TONE 5	5	1530	1530	1209	1530	1400	1400	1446	1446	1446	1446	652.0	941	1305	1387.5
TONE 6	6	1670	1670	1308	1670	1530	1530	1540	1540	1540	1540	601.0	1040	1446	1537.5
TONE 7	7	1830	1830	1415	1830	1670	1670	1640	1640	1640	1640	554.0	1209	1587	1687.5
TONE 8	8	2000	2000	1531	2000	1830	1830	1747	1747	1747	1747	510.7	1336	1728	1837.5
TONE 9	9	2200	2200	1657	2200	2000	2000	1860	1860	1860	1860	470.8	1477	1869	1987.5
GROUP TONE	A	2800	885	1939	970	825	825	2400		1050	1055			2433	
	B	810	810	2270	810	740	886	930		930	930			2292	
RESET TONE	C	970	740	2098	2800	2600	2600	2247		2400	2247			2010	
	D	885	680	2457	885	885	856	991	2110	991	991			2292	
REPEAT TONE	E	2600	970	1792	2600	2400	2400	2110	2400	2110	2110	1062.9	1805	459	487.5
	F	680	2600		680	680		1055			2400		1995	1091	

IP-223 Jumper Settings

PCB 750743 or PCB 750630 revision F

Line 1	Jumper Setting	Line 2
J35	A = RS232 serial data, B = TTL	J26

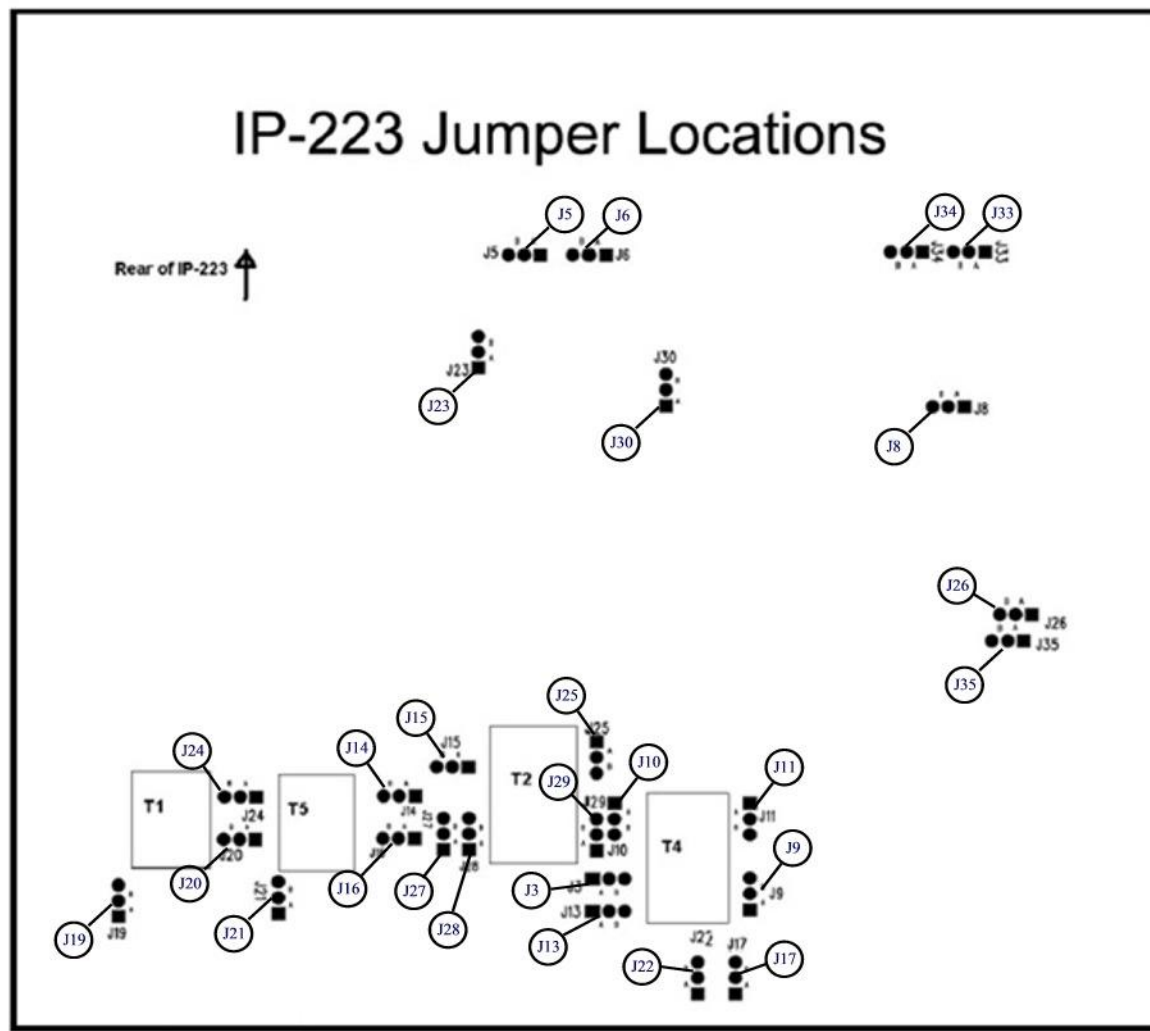
PCB 750743 or PCB 750630 revision C, D, E, and F

Line 1	Jumper Setting	Line 2
J33, J34	2 or 4 Wire, A = 2-wire, B = 4-wire	J5, J6
J16, J21	RX Input, A = Single ended, B = Balanced	J19, J20
J14	RX Input Impedance, “A” = 600, B = 8 and Center = 10Kohm	J24
J3, J9, J11	TX Output, A = Single ended, “B” = Balanced	J25, J28, J29
J13	TX Output Level, “A” = Low, B = High	J27
J8	Digital I/O Pull-up Voltage, A = +5, “B” = +12	J30
J17, J22	TX Output Impedances: “B” = 600 ohms	J10, J15
(J17), J22	(A) and B = 1.2K ohms	(J10), J15
J17, (J22)	A and (B) = 1.8K ohms	J10, (J15)
J17, J22	A = 2.4K ohms	J10, J15

PCB 750630 revision A

Line 1	Jumper Setting	Line 2
J33, J34	2 or 4 Wire, A = 2-wire, B = 4-wire	J5, J6
J15, J16, J21	RX Input, A = Single ended, B = Balanced	J19, J20, J22
J14, J23	RX Input Impedances: B = 10K ohms	J24, J17
(J14), J23	(A) and B = 600 ohms	(J24), J17
(J23), J14	(A) and B = 8 ohm speaker	(J17), J24
J3, J9, J10, J11	TX Output, A =Single ended, B = Balanced	J25, J26, J28, J29
J13	TX Output Level, A = Low, B High	J27
J8	Digital I/O Pull-up Voltage, A = +5, B = +12	J30

IP-223 Jumper Locations



IP-223 Telnet Monitor Commands

Verify IP-223 is working and monitor audio events

IP-223 is connected to a radio and your not getting any receive audio back to your console. Use telnet to see if you have network connectivity and you can also see if the IP-223 is seeing any rx audio coming from the radio. The user name for this mode is "admin" and the password is "telnet". This is the default telnet mode and you will be able to view any RX or TX operations the IP-223 is currently processing at the present time.

Monitor IP-223 RS-232 serial data port

Telnet sessions in the IP-223 can also show serial data coming from specific radios. *(Most of the time you would never use this unless you like reading in hexadecimal.)* To view this mode for radios attached to serial 1 log into the IP-223 with username "serial1" and password "on". To view serial port 2 information the username is "serial2" and password "on".

Monitor IP-223 iDen ANI and events

Telnet sessions in the IP-223 can also show incoming iDEN radio ANI and other features on attached Falcon Series iDEN phones. The user name for this mode is "lego" and the password is "mania"

IP-223 LCD Display Readout Key

LCD Display

The **LCD** display provides panel status information, such as the IP and Subnet Addresses, line status, and handset line selection.

- TX F# (# is the selected function tone) indicates a PTT is active.
- RX F# (# is the selected function tone) indicates the RX radio is active.
- ID # displays when a Fleetsync or **MDC** (Mobile Daughter Card) ANI ID is decoded. This does not include serial decoding.
- When connected to a serially controlled radio, iDEN, Sepura, Kenwood or Johnson displays.
- INTCOM displays when the front panel IC button is pressed.
- EnetIC displays when the console generated intercom is received.
- CTX F# displays when the console mode IP-223 decodes tones from a tone console in Console mode.
- CRX F# displays when the IP-223 transmits wire-line audio to a legacy tone console in Console mode.
- PTX F# displays when the IP-223 decodes tones from a legacy tone console attached in parallel in Tone mode.
- CPT F# displays when the IP-223 transmits to a line if the line-to-line crosspatch is enabled.
- Ring displays when there is an incoming phone call in Phone mode.
- Offhook displays when the line is in use during a phone call.
- LLM displays when no phone line is connected to the PIB or TDI in Phone mode.
- NO LINE ENABLED displays after power-up if neither line is enabled.
- Scan List.... displays during power up while the IP-223 is communicating with serial controlled radios that support the Scan List feature.

IP-223 ANI Call Format Characters

ANI Call Format Field

The **ANI Call Format** field identifies the call string format for the ANI Decoder #. This field can contain up to *16 digits*.

NOTE: Use 0–9, A–D, *, and # for DTMF tone types or 0–9, A–F, for all other tone types as well as the following

characters:

- I (Caller ID) - Placed into the ID field of the ANI packet or the ANI field of the caller portion of the telegram. The ID is stored as a 32-digit string in the packet.
- G (Group Digits) - Stored in the Group section of the ANI packet. The group value is converted to a decimal number and is stored as an 8-digit string in the packet.
- S (Status) - Digits represented by S are interpreted as status information. These values are converted to decimal numbers and stored as an 8-digit status string in the ANI packet. The console has a corresponding list of the status numbers and descriptions that are displayed upon receipt of the packet.
- P (Pause) - When inserted into the string, a pause is expected in this location. The pause duration is set in the Pause Duration field (see "Pause Duration Field - Local and Tone Modes").
- R (Calling ID) - Used to delineate the location of the digits being used for a selective call. These digits represent the address or ID of the person being called. They are stored in the ANI packet as an 8-digit string

IP-223 Remote Cross Patch (RCP)

Remote Cross Patch (RCP) Mode Types

Mode Drop Down Menu

The **Mode** drop down menu identifies the crosspatch mode used for the crosspatch entry number.

Available selections for this field are:

XPTCH - Crosspatch to a remote IP-223. The IP Address and line number is required.

DIAL - A remote user with a portable radio can key a DTMF string, causing the IP-223 to take the PIB or TDI off hook, dial a pre-programmed phone number and establish a patch between the devices.

DLVOIP - A remote user with a portable radio can key a DTMF string, causing the IP-223 to join different multicast groups and ports, which can cause mapping the IP to a different line.

PHONEP - A remote user with a portable radio can key a DTMF string, causing the IP-223 to take the PIB or TDI off hook. Once the PIB or TDI is off hook, the user can manually dial a phone number.

LPTCH - Line-to-line crosspatch. Enable and disable using DTMF strings.

Notes