

### 1. Purpose

This document provides cabling and installation information about the TSI main distribution frame Terminal Block Kit engineered for the GoDigital® XCel™ Multi-Service Shelf. This kit contains two terminal blocks and either a 19-inch or 23-inch mounting bracket, and is manufactured by TSI of Florida. The Kit is available through major distributors or from the manufacturer.

### 2. Products

This Installation Note is relevant for the following GoDigital products:

System / Product Name	GoDigital Part #	Description and Supplier Direct Part Number
<b>Terminal Blocks for XCel Multi-Service Shelves</b>		
KIT, TRM BLK BAR 19H, TSI	990227	TSI Terminal Block Kit for 19-inch XCel Multi-Service Shelf TSI Part Number: TSI Part # "TSI-1032-19G-DSL-2"
KIT, TRM BLK BAR 23H, TSI	990228	TSI Terminal Block Kit for 23-inch XCel Multi-Service Shelf TSI Part Number: TSI-1032-23G-DSL-2

Each of the above kits includes:

- One each Terminal Block A (19-inch or 23-inch)
- One each Terminal Block B (19-inch or 23-inch)
- One each Mounting Bar with mounting hardware (19-inch or 23-inch)

### 3. Overview

The Multi-Service Shelf supports GoDigital's XCel-8, XCel-12 and other planned systems using either a 19-inch or 23 inch XCel Multi-Service Shelf. The Multi-Service Shelf terminates the POTS connections to the switch and the DSL pairs on RJ-21 backplane connectors. Multiple 25-pair cables from these connectors run to the main frame where they terminate on a cross connect block used for line assignments. TSI of Florida engineered Terminal Block Kits that contain two blocks and provides an organized pin array for this purpose. These blocks have wire wrap connections on each side.

### 4. Block Installation and Use

The TWO blocks in the kit will terminate up to 20 line cards from a 23-inch XCel Multi-Service Shelf, or 16 XCel line cards in a 19-inch XCel Multi-Service Shelf.

Each cable contains the tip and ring pairs for two line cards, or for the DSLs that are assigned to half of a Multi-Service Shelf.

- For a 23-inch shelf this results in six (6) cables on the 23-inch TERMINAL BLOCK A, and six (6) cables on the 23-inch TERMINAL BLOCK B.
- For a 19-inch shelf this results in five (5) cables on the 19-inch TERMINAL BLOCK A, and five (5) cables on the 19-inch TERMINAL BLOCK B.

In many installations customers will choose to remove the two blocks from the mounting bar for placement at the MDF in accordance with local practices. The individual blocks have mounting hole centers of 7.5", 6", 5", and 3 ¼". These options support nearly all frame configurations. Lucent Type 89 frames require a special Lucent bracket (Comcode 601 196 843), not available from GoDigital.

**NOTE: The XCel Multi-Service Shelf should normally be mounted within 300 feet (total POTS cabling distance) of the central office POTS switch. The maximum distance should not exceed 500 feet. If the shelf is mounted too far from the switch service ports, the XCel V.90 signal processing capability on analog POTS lines may be reduced or disabled.**

# Installation Note

## TSI TERMINAL BLOCK KIT, XCel Multi-Service Shelf



### 5. Ordering Information

Each Kit has two terminal blocks and a mounting bar. Mounting bar use is not required.

**NOTE: TWO BLOCKS are ALWAYS REQUIRED**

Two blocks are always required to support any Multi-Service Shelf. This is true whether the shelf is a 19-inch with 16 linecard slots, or 23-inch with 20 card slots. This is due to the high line density served from either shelf.

**NOTE: The BLOCKS in the 19-inch and 23-inch KITS ARE DIFFERENT**

The labeling is different on the 23-inch blocks compared to the 19-inch blocks. The 23-inch Terminal Block Kit is used to support the 23-inch Multi-Service Shelf. If a 23-inch Multi-Service Shelf is ordered, use the 23-inch Terminal Block Kit ONLY. The 19-inch Terminal Block Kit is used to support the 19-inch Multi-Service Shelf. If a 19-inch Multi-Service Shelf is ordered, use the 19-inch Terminal Block Kit ONLY. Even if a 19-inch Shelf is being installed in a 23-inch Rack, the 19-inch Terminal Block Kit MUST still be used.

**5.1** GoDigital will maintain some limited stocking levels of the TSI Terminal Block Kits. In most cases these kits should be ordered directly from TSI, or from Telco stocking distributors.

**5.2** Contact for ordering equivalent DIRECT from TSI:

TSI Cust. Service TSI of Florida  
P.O. box 1484  
Brandon, FL 33509-1484  
or

TSI of Florida  
6312 S 78th St.  
Riverview, FL 33569  
Tel: (813) 671-2218

**5.3** The TSI part numbers are:

**TSI-1032-19G-DSL-2** (GoDigital Part # 990227)  
19-inch TERMINAL BLOCK KIT for the 19-inch Multi-Service shelf.  
Includes:

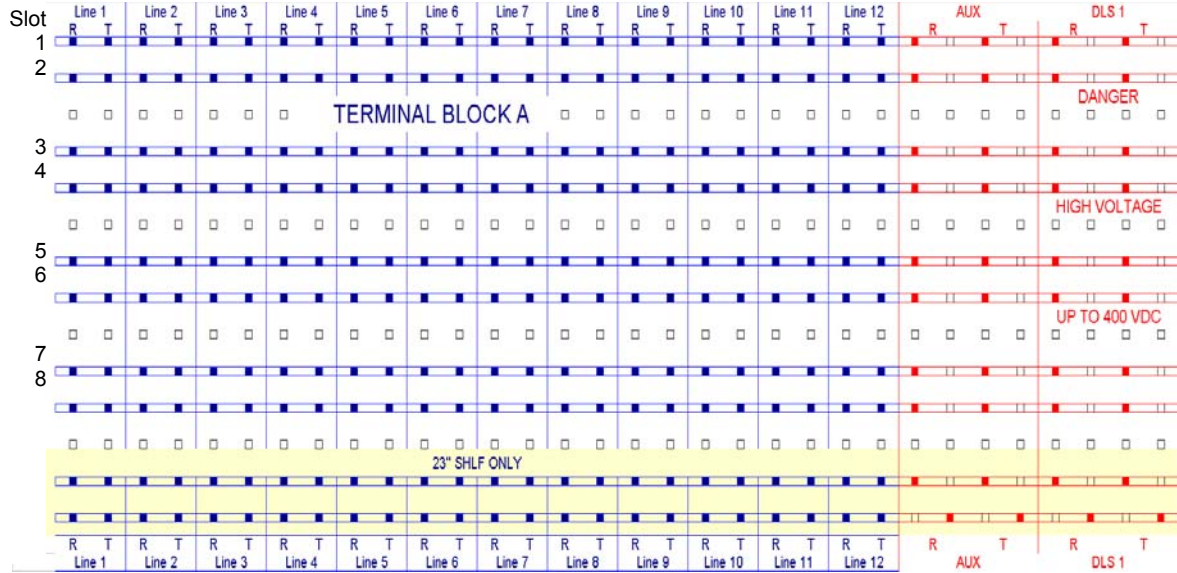
- 19-inch Terminal Block A
- 19-inch Terminal Block B
- One 19-inch Mounting Bar

**TSI-1032-23G-DSL-2** (GoDigital Part # 990228) TSI TERMINAL BLOCK KIT for the 23-inch Multi-Shelf Includes:

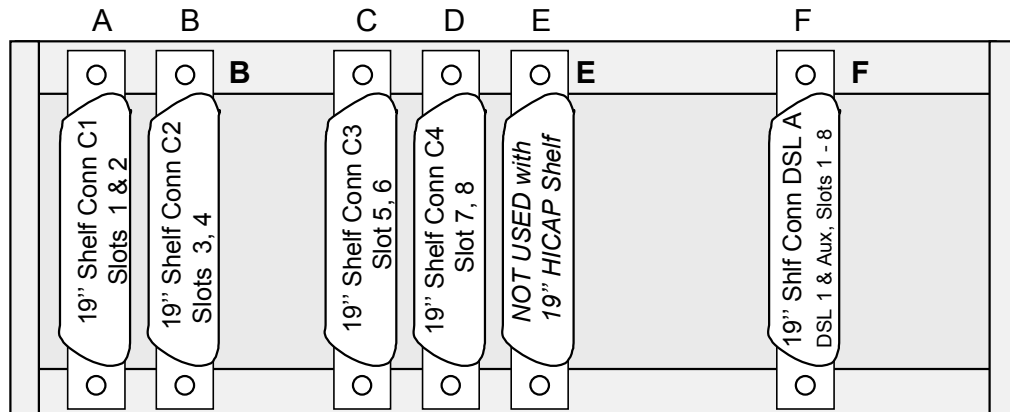
- 23-inch Terminal Block A
- 23-inch Terminal Block B
- One 23-inch Mounting Bar

### 6. 19-inch Terminal Block Kit Drawings and Cabling

#### 19-inch Multi-Service Shelf - 19-inch TERMINAL BLOCK A Wire Wrap Pin Lay-Out



#### 19-inch Multi-Service Shelf - 19-inch TERMINAL BLOCK A AMP Connector Designations



#### 19-inch Multi-Service Shelf Cables to 19-inch TERMINAL BLOCK A

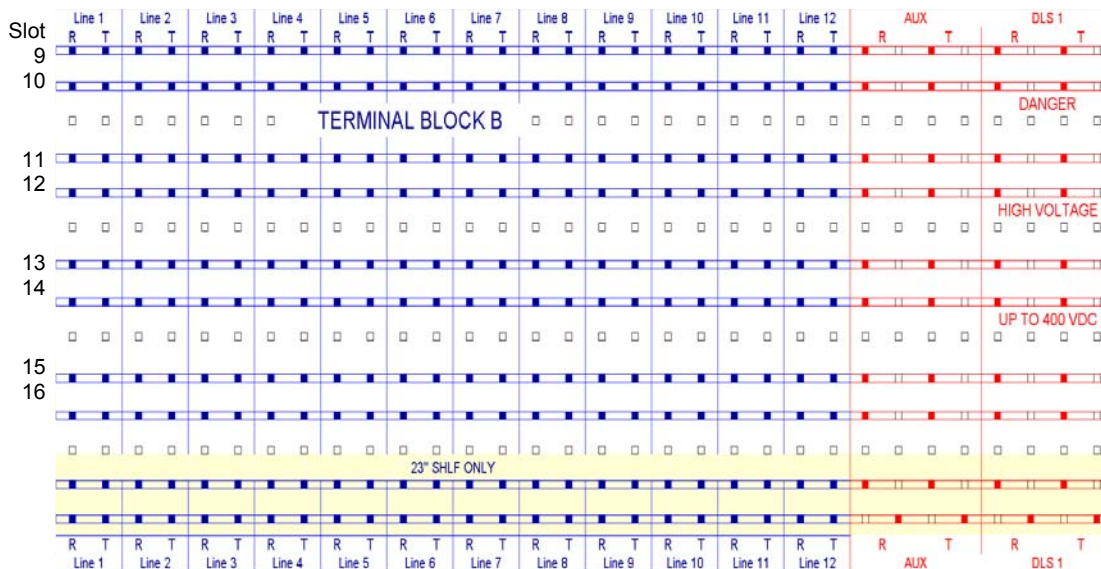
19-inch Term Blk	19-inch Shelf		Description	# Lines / Pairs	# Pins	
	Conn #	19-inch Slot				
A	C1	1 & 2	12 Svc. Lines / slot	24	48	19-inch Shelf
B	C2	3 & 4	12 Svc. Lines / slot	24	48	19-inch Shelf
C	C3	5 & 6	12 Svc. Lines / slot	24	48	19-inch Shelf
D	C4	7 & 8	12 Svc. Lines / slot	24	48	19-inch Shelf
E			<b>Not Used</b>			
F	DSL A	1 - 8	1 DSL Line & 1 AUX Line / slot	16	32	19-inch Shelf

# Installation Note

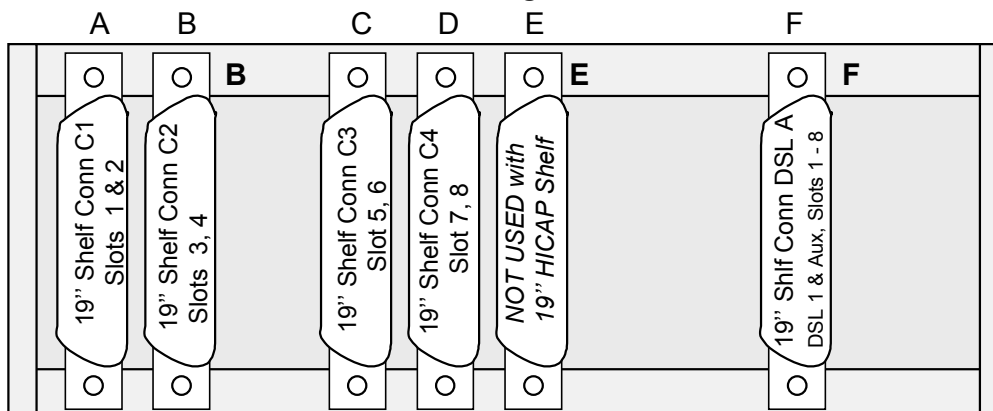
## TSI TERMINAL BLOCK KIT, XCel Multi-Service Shelf



### 19-inch Multi-Service Shelf - 19-inch TERMINAL BLOCK B Wire Wrap Pin Lay-Out



### 19-inch Multi-Service Shelf - 19-inch TERMINAL BLOCK B AMP Connector Designations

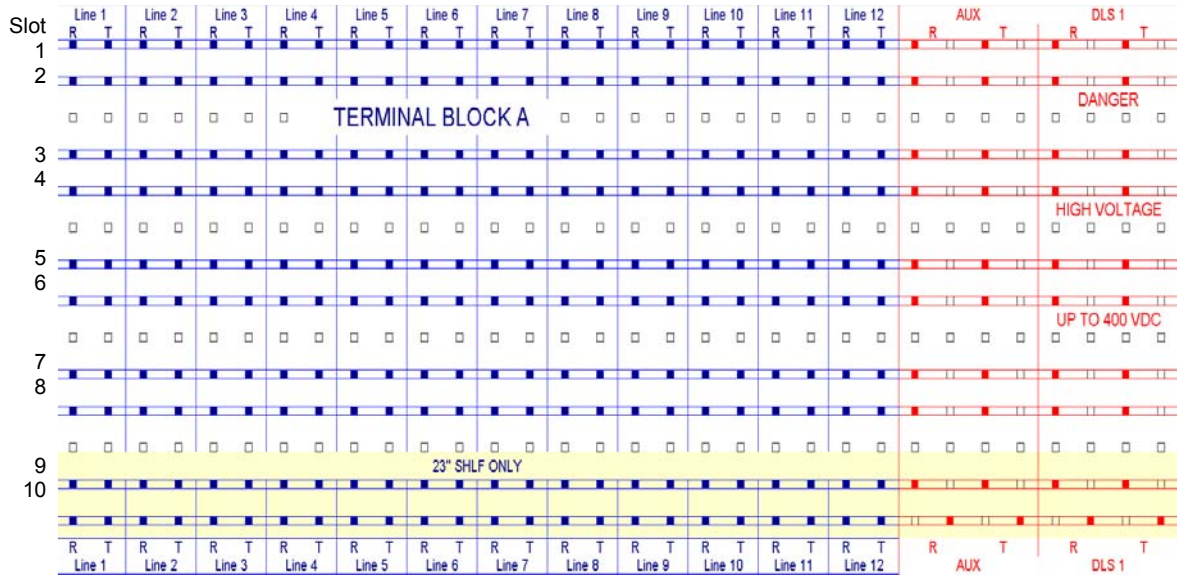


### 19-inch Multi-Service Shelf Cables to 19-inch TERMINAL BLOCK B

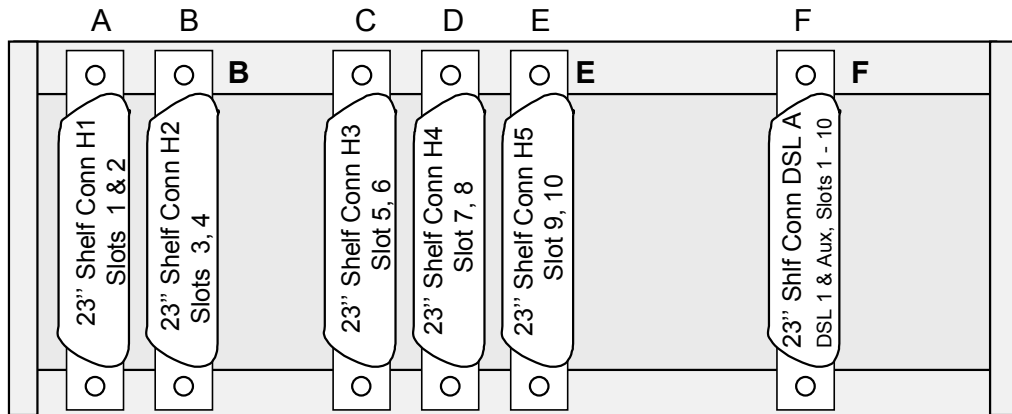
19-inch Term Blk	19-inch Shelf		Description	# Lines / Pairs	# Pins	
	Conn #	19-inch Slot		Supported	Used	
A	C5	9 & 10	12 Svc. Lines / slot	24	48	19-inch Shelf
B	C6	11 & 12	12 Svc. Lines / slot	24	48	19-inch Shelf
C	C7	13 & 14	12 Svc. Lines / slot	24	48	19-inch Shelf
D	C8	15 & 16	12 Svc. Lines / slot	24	48	19-inch Shelf
E			<b>Not Used</b>			
F	DSL B	9 - 16	1 DSL Line & 1 AUX Line / slot	16	32	19-inch Shelf

### 7. 23-inch Terminal Block Kit Drawings and Cabling

#### 23-inch Multi-Service Shelf Cables to 23-inch TERMINAL BLOCK A



#### 23-inch Multi-Service Shelf - 23-inch TERMINAL BLOCK A AMP Connector Designations



#### 23-inch Multi-Service Shelf Cables to 23-inch TERMINAL BLOCK A

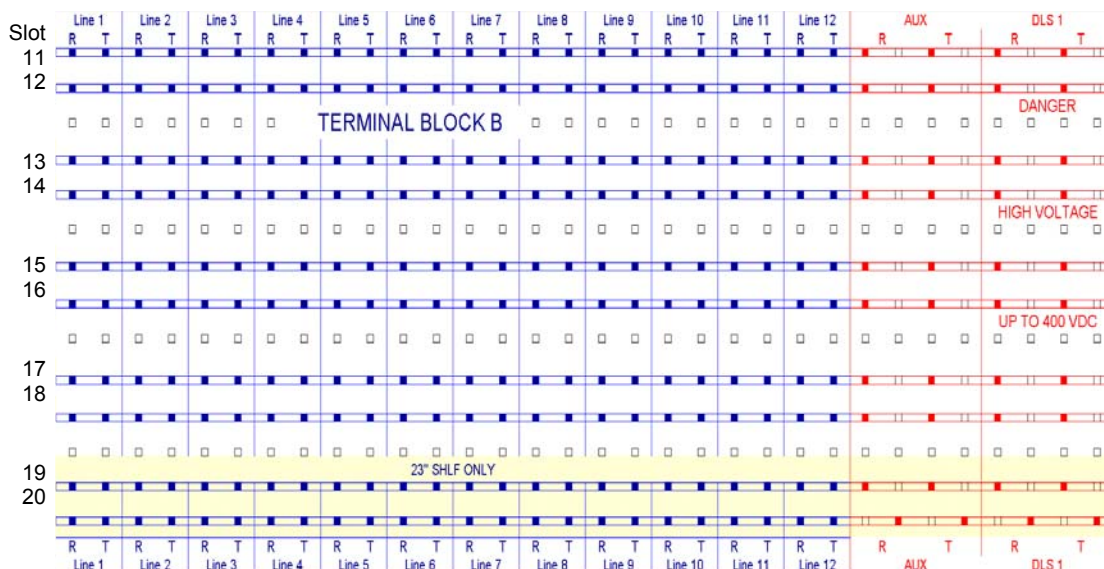
23-inch Term Blk	23' Shelf		Description	# Lines / Pairs Supported	# Pins Used	
	Conn #	19-inch Slot				
A	H1	1 & 2	12 Svc. Lines / slot	24	48	23-inch Shelf
B	H2	3 & 4	12 Svc. Lines / slot	24	48	23-inch Shelf
C	H3	5 & 6	12 Svc. Lines / slot	24	48	23-inch Shelf
D	H4	7 & 8	12 Svc. Lines / slot	24	48	23-inch Shelf
E	H5	9 & 10	12 Svc. Lines / slot	24	48	23-inch Shelf
F	DSL A	1 - 10	1 DSL Line & 1 AUX Line / slot	20	40	23-inch Shelf

# Installation Note

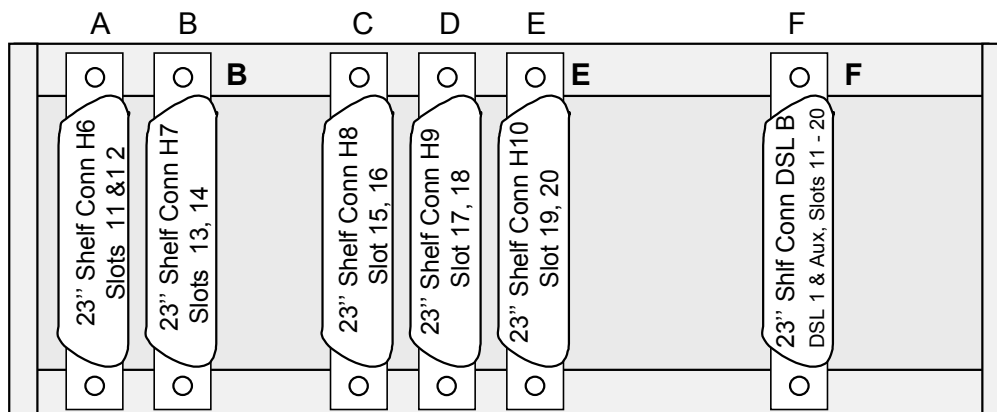
## TSI TERMINAL BLOCK KIT, XCel Multi-Service Shelf



### 23-inch Multi-Service Shelf Cables to 23-inch TERMINAL BLOCK B



### 23-inch Multi-Service Shelf - 23-inch TERMINAL BLOCK B AMP Connector Designations



### 23-inch Multi-Service Shelf Cables to 23-inch TERMINAL BLOCK B

23-inch Term Blk	23-inch Shelf		Description	# Lines / Pairs Supported	# Pins Used	
	Conn #	19-inch Slot				
A	H6	11 & 12	12 Svc. Lines / slot	24	48	23-inch Shelf
B	H7	13 & 44	12 Svc. Lines / slot	24	48	23-inch Shelf
C	H8	15 & 66	12 Svc. Lines / slot	24	48	23-inch Shelf
D	H9	17 & 18	12 Svc. Lines / slot	24	48	23-inch Shelf
E	H10	19 & 20	12 Svc. Lines / slot	24	48	23-inch Shelf
F	DSL B	11 - 20	1 DSL Line & 1 AUX Line / slot	20	40	23-inch Shelf

### 8. Pin Array and Description

19-inch TSI Terminal Block Kit Front views and shelf cabling are provided in Paragraph 6 of this document. 23-inch TSI Terminal Block Kit Front views and shelf cabling are provided in Paragraph 7 of this document. In all cases, the views show DSL and AUX pairs at the right, going from top to bottom, and Line Service channels one through 12 going from left to right.

Extra spacing is provided around the DSL and AUX wire wrap pins because of the higher DSL line powering voltages that are present. The DSL and AUX pins are clearly identified by red markings and a DANGER HIGH VOLTAGE warning. Across the top row of TERMINAL BLOCK A, the Line pairs and the DSL 1 and AUX pairs correspond to Slot 1 in the XCel Multi-Service Shelf. Remaining rows correspond to the labeled XCel Multi-Service Shelf Slots as noted.

Each TSI block is equipped with six (6) male RJ-21 AMP champ connectors, for a total of 12 with the pair of blocks together. The 19-inch shelf has ten (10), and the 23-inch shelf has twelve (12) male RJ-21 AMP Champ 25-pair bulkhead connectors, which provide for cable connections to the main frame. Drawings are provided at the end of this document showing the location of the connectors on the XCel Multi-Service Shelf backplanes.

The ten cables from the 19-inch shelf or 12 cables from the 23-inch shelf are terminated on a frame block and should be organized in accordance with local practice. A variety of frame block styles exist, with either connectorized or wire-wrap terminations.

**NOTE: The XCel Multi-Service Shelf should normally be mounted within 300 feet (total POTS cabling distance) of the central office POTS switch. The maximum distance should not exceed 500 feet. If the shelf is mounted too far from the switch service ports, the XCel V.90 signal processing capability on analog POTS lines may be reduced or disabled.**

To install these blocks:

- Run the 25-pair cables from the shelf to the main frame location of the frame block.
- Terminate each cable with a female RJ-21 AMP Champ connector.

# Installation Note

## TSI TERMINAL BLOCK KIT, XCel Multi-Service Shelf



### 9. Backplane Connectors and Pin-outs for Service Line

Tables 9-1 and 9-2 show backplane Connector - Service Line Pin-Outs for 19 and 23-inch Multi-Service Shelves.

- The 19-inch Multi-Service Shelf labels its service line connectors from C1 to C8.
- The 23-inch Multi-Service Shelf labels its service line connectors from H1 to H10.

“Single-wide” CTUs take up one slot in an XCel Shelf and all pairs from the single-wide CTUs are routed to the odd or even slot pairs as noted in Table 9-1.

“Double-wide” CTUs take up two slots each in an XCel Shelf and all pairs from the double-wide CTUs are routed to the odd or even slot pairs as noted in Table 9-2. Double-wide cards have a wider faceplate ensuring that shelf loading is properly managed. It is recommended that double-wide CTUs be placed with the left side of the CTU in the ODD slot for optimum capacity loading, but this is not required.

**Table 9-1**  
**Single-Wide CTU**  
**Service Line Pin Assignments**

Connector #	Connector Pin #		Single-Wide CTUs (X = Odd slot)	
	Tip	Ring	XCel-8 POTS Line #	XCel-12 POTS Line #
<b>C1 - C8 (19")</b>	26	1	1	1
	27	2	2	2
	28	3	3	3
	29	4	4	4
	30	5	5	5
	31	6	6	6
	32	7	7	7
	33	8	8	8
	34	9	not used	9
	35	10	not used	10
	36	11	not used	11
	37	12	not used	12
<b>or</b> <b>H1 - H10 (23")</b>	<i>Even # Slot X + 1</i>			
	38	13	1	1
	39	14	2	2
	40	15	3	3
	41	16	4	4
	42	17	5	5
	43	18	6	6
	44	19	7	7
	45	20	8	8
	46	21	not used	9
	47	22	not used	10
	48	23	not used	11
	49	24	not used	12
50	25	not used	not used	

**Table 9-2**  
**Double-Wide CTU**  
**Service Line Pin Assignments**

Connector #	Connector Pin #		Double-Wide CTUs (X = Odd slot)
	Tip	Ring	XCel-4a ADSL Line #
<b>C1 - C8 (19")</b>	26	1	1
	27	2	2
	28	3	3
	29	4	4
	30	5	not used
	31	6	not used
	32	7	not used
	33	8	not used
	34	9	not used
	35	10	not used
	36	11	not used
	37	12	not used
<b>or</b> <b>H1 - H10 (23")</b>	<i>Even # Slot X + 1</i>		
	38	13	1
	39	14	2
	40	15	3
	41	16	4
	42	17	not used
	43	18	not used
	44	19	not used
	45	20	not used
	46	21	not used
	47	22	not used
	48	23	not used
	49	24	not used
50	25	not used	

### 10. Backplane Connector – DSL Pair Pin-Outs for 19-inch and 23-inch XCel Multi-Service Shelves.

Each Multi-Service Shelf has two connectors for DSL outbound pairs. On the backplane these connectors are labeled DSL A and DSL B. The DSL A connector carries the DSL 1 and AUX (a secondary outbound line) pairs from half of the card slots in the Multi-Service Shelf. DSL B carries the DSL 1 and AUX pairs from the second half of the shelf.

Note: In the tables 10-1 and 10-2 (for DSL A and DSL B connectors) “DSL X-2” identifies the AUX pair on the terminal block for slot X. Most XCel systems use only one DSL (labeled DSL X-1 in the table) outbound from each slot or system CTU. However the shelf backplane and connectors support an extra outbound pair for use with future planned system options. The terminal block AUX wire wrap pins have the same extra spacing as the DSL X-1 pins.

**Table 10-1**  
**Connector DSL A**

**Line Pin-outs from XCel Multi-Service Shelves**

Conn. #	Connector Pin		XCel Multi-Service Shelf			
	Tip	Ring	23-inch Shelf		19-inch Shelf	
			Slot #	DSL Line	Slot #	DSL Line
<b>DSL A</b>	26	1	1	DSL 1-1	1	DSL 1-1
	27	2	1	DSL 1-2	1	DSL 1-2
	28	3	2	DSL 2-1	2	DSL 2-1
	29	4	2	DSL 2-2	2	DSL 2-2
	30	5	3	DSL 3-1	3	DSL 3-1
	31	6	3	DSL 3-2	3	DSL 3-2
	32	7	4	DSL 4-1	4	DSL 4-1
	33	8	4	DSL 4-2	4	DSL 4-2
	34	9	5	DSL 5-1	5	DSL 5-1
	35	10	5	DSL 5-2	5	DSL 5-2
	36	11	6	DSL 6-1	6	DSL 6-1
	37	12	6	DSL 6-2	6	DSL 6-2
	38	13	7	DSL 7-1	7	DSL 7-1
	39	14	7	DSL 7-2	7	DSL 7-2
	40	15	8	DSL 8-1	8	DSL 8-1
	41	16	8	DSL 8-2	8	DSL 8-2
	42	17	9	DSL 9-1	not used	not used
	43	18	9	DSL 9-2	not used	not used
	44	19	10	DSL 10-1	not used	not used
	45	20	10	DSL 10-2	not used	not used
46	21		not used	not used	not used	not used
47	22		not used	not used	not used	not used
48	23		not used	not used	not used	not used
49	24		not used	not used	not used	not used
50	25		not used	not used	not used	not used

**Table 10-2**  
**Connector DSL B**

**Line Pin-outs from XCel Multi-Service Shelves**

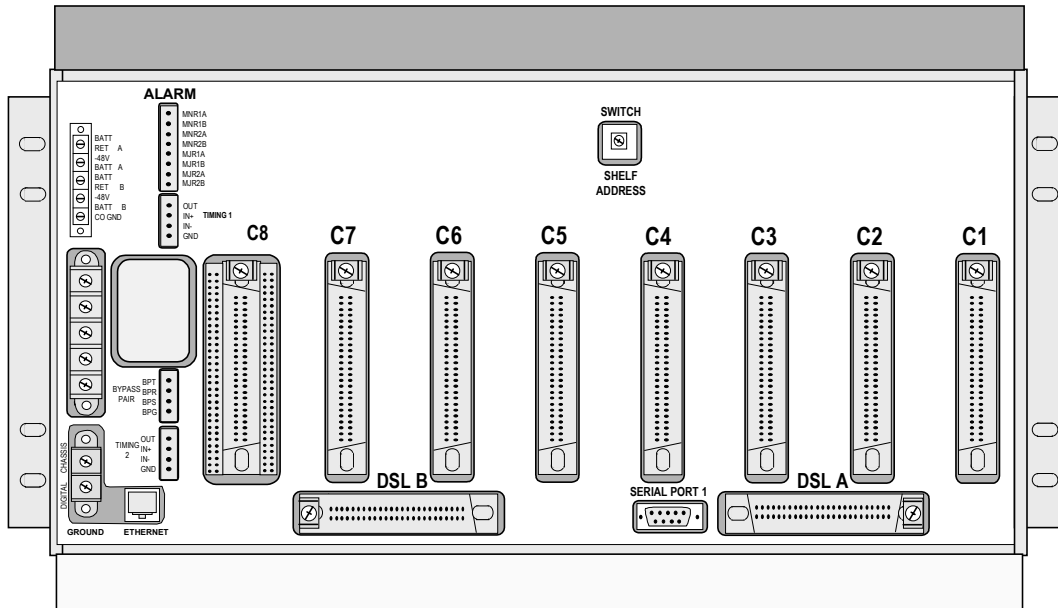
Conn. #	Connector Pin		XCel Multi-Service Shelf				
	Tip	Ring	23-inch Shelf		19-inch Shelf		
			Slot #	DSL Line	Slot #	DSL Line	
<b>DSL B</b>	26	1	11	DSL 11-1	9	DSL 9-1	
	27	2	11	DSL 11-2	9	DSL 9-2	
	28	3	12	DSL 12-1	10	DSL 10-1	
	29	4	12	DSL 12-2	10	DSL 10-2	
	30	5	13	DSL 13-1	11	DSL 11-1	
	31	6	13	DSL 13-2	11	DSL 11-2	
	32	7	14	DSL 14-1	12	DSL 12-1	
	33	8	14	DSL 14-2	12	DSL 12-2	
	34	9	15	DSL 15-1	13	DSL 13-1	
	35	10	15	DSL 15-2	13	DSL 13-2	
	36	11	16	DSL 16-1	14	DSL 14-1	
	37	12	16	DSL 16-2	14	DSL 14-2	
	38	13	17	DSL 17-1	15	DSL 15-1	
	39	14	17	DSL 17-2	15	DSL 15-2	
	40	15	18	DSL 18-1	16	DSL 16-1	
	41	16	18	DSL 18-2	16	DSL 16-2	
	42	17	19	DSL 19-1	not used	not used	
	43	18	19	DSL 19-2	not used	not used	
	44	19	20	DSL 20-1	not used	not used	
	45	20	20	DSL 20-2	not used	not used	
	46	21		not used	not used	not used	not used
	47	22		not used	not used	not used	not used
	48	23		not used	not used	not used	not used
	49	24		not used	not used	not used	not used
	50	25		not used	not used	not used	not used

# Installation Note

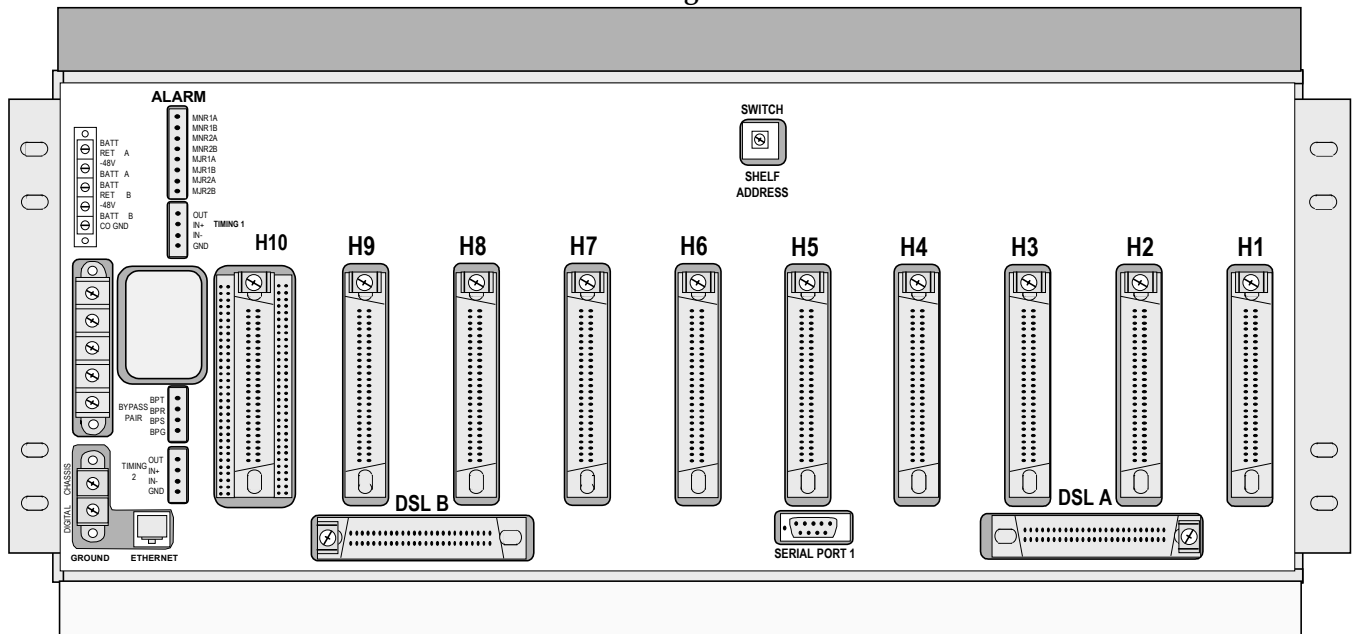
## TSI TERMINAL BLOCK KIT, XCel Multi-Service Shelf



**XCel Multi-Service 19-inch Shelf: Rear View Showing Connector Locations**



**XCel Multi-Service 23-inch Shelf: Rear View Showing Connector Locations**



### CONTACTING GODIGITAL

GoDigital Networks Corporation  
 41652 Boscell Road  
 Fremont, CA 94538  
 1-800-297-2424  
 1-510-979-2200  
 Fax 510-226-8785  
 Email  
 GoDigital Sales: [sales@godigital.com](mailto:sales@godigital.com)  
 Technical Assistance: [product.support@godigital.com](mailto:product.support@godigital.com)