Plug-in Expandable Telephone Card

751321 & 751321/A

Description and Installation

POSITRON

Positron Inc.

DOCUMENT CONTROL INFORMATION

Document Part Number:	925-751321-001, Rev 3
Document Issue Number:	3
Publication Date:	January 6, 2003
Document ID:	o02iy000.fm

CONFIDENTIALITY NOTICE

DISCLAIMER NOTICE

Although Positron Inc. has made every effort to ensure the accuracy of the information contained herein, this document is subject to change without notice.

TECHNICAL CUSTOMER SUPPORT

Should a problem arise, contact your customer support department. If the problem cannot be resolved by your support department or if you have any questions, contact Positron's Technical Customer Support department at 1-888-577-5254.

1. The Plug-In Expandable Telephone Card and Add-on Telephone Card

The Plug-in Expandable Telephone Card, model 751321 and the Add-on Telephone Card, model 751321/A provides high voltage isolation between a telephone line and the drop side of one loop start telephone circuit (telephone, dial-up modem, fax, or loop start private branch exchange (PBX)).

With the add-on 751321/A installed on the 751321 you upgrade from a single line isolator to a double line isolator at any time.

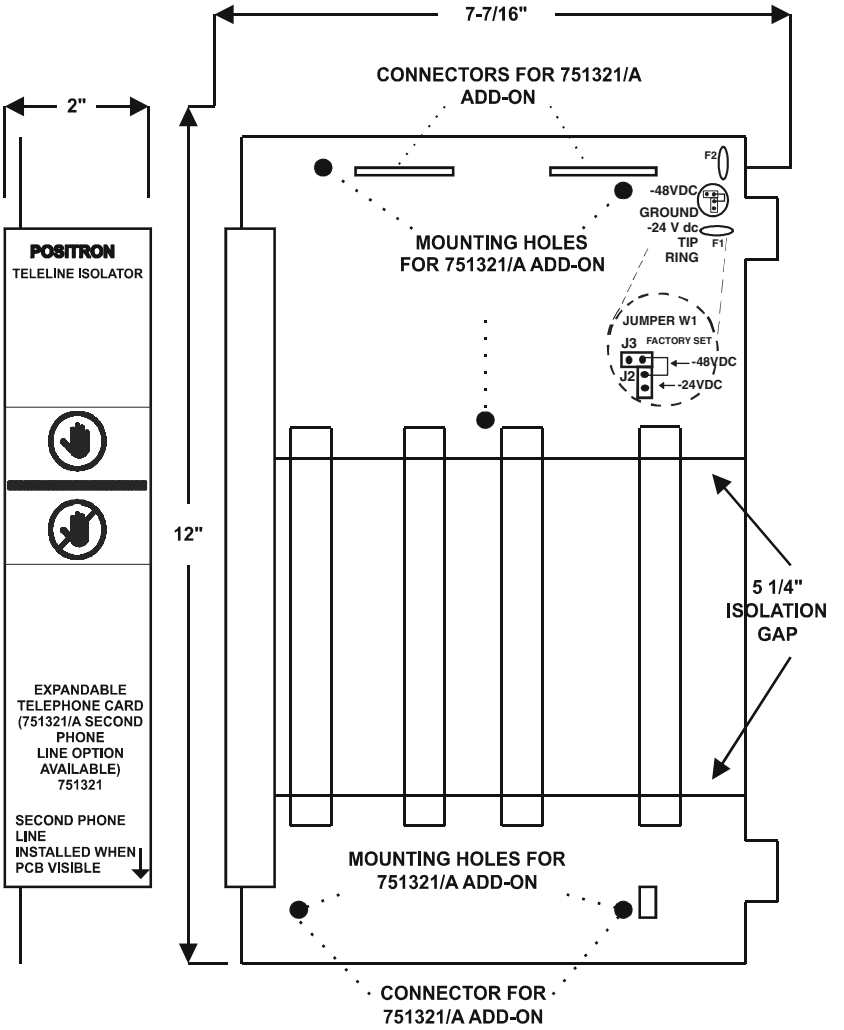
The unit is designed for use with the Teleline Isolator Three, Five and Eight card shelves.

Its features include the following:

- The 751321without the 751321/A Add-on card may be used with both the old and the new generation Three, Five and Eight-card Teleline Shelves. The 751321 is a direct replacement for the Plug-in Fiberline Telephone Card model 751311. The 751321/A may be used only with the new generation shelves.
- The card operates from either a -24 V or -48 V dc supply (provided by the shelf's power supply or from a source external to the shelf).
- The Central Office (CO) side circuit components are powered from the battery feed.
- The card withstands 600V power cross (as per UL1950) with automatic restoration of service.
- The card's ringing generator can ring up to five standard 500 type sets.

For a view of the Plug-in Expandable Telephone Card, refer to Figure 1.

Figure 1 Model 751321 Component Layout (Only Major Components Shown)



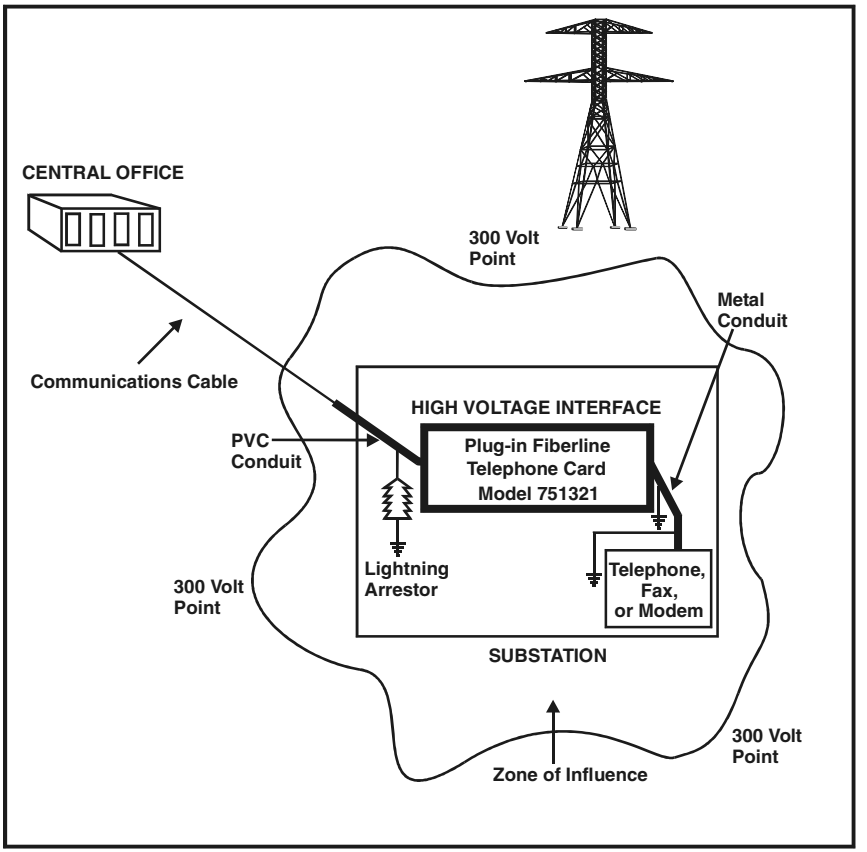
2. Applications

The applications of the Expandable Telephone Card include the following:

- Loop start telephone (POTS)
- Fax and dial-up "smart" modems (up to 56.6 Kb modem, speed of 45.3 Kb/s if line permits)
- Loop start PBX
- Dial-up remote meter reading

For an illustration of the card's applications, refer to Figure 2.

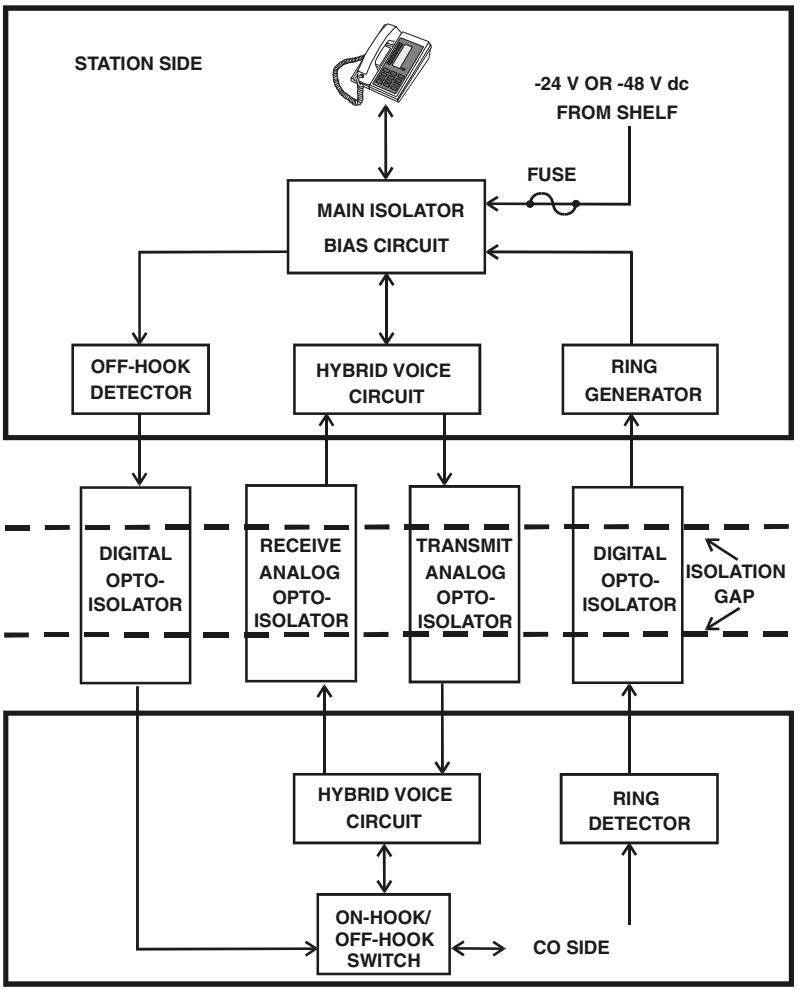
Figure 2 High Voltage Interface Applications



3. Hardware Description

The Expandable Telephone Card is comprised of two sides. With the card facing you the Station side is located on the upper portion of the card and the CO side is located on the lower portion of the card. The Station side is separated from the CO side by the opto-isolators which create a 5¼ inch isolation gap. For the card's block diagram, refer to Figure 3.

Figure 3 Block Diagram



The following is a description of the elements of the Expandable Telephone Card block diagram.

On Hook/Off Hook Switch

The On Hook/Off Hook Switch is a metal oxide semiconductor field effect transistor (MOSFET) current limiting circuit that is turned on by the Off Hook signal. When switched on, it permits modulation of the hybrid voice circuits.

Hybrid Voice Circuits

The Hybrid Voice Circuits located on both the Station and CO sides of the card form a two-wire to four-wire to two-wire configuration that permits the separation of Transmit (TX) and Receive (RX) signals. These circuits also perform an impedance matching function such that the Station side impedance is reflected to the CO side. This renders the card effectively transparent for communication purposes.

Ring Detector

The Ring Detector is a bandpass filter centered at about 30 Hz. It detects ringing signals and sends pulses to the ring generator on the Station side, via Digital Opto-Isolators.

Digital Opto-Isolators

Each Digital Opto-Isolator consists of a light emitting diode (LED) and a phototransistor pair operating in the infrared region of the electromagnetic spectrum. They provide lightwave digital signal transmission across the isolation gap.

Transmit and Receive Analog Opto-Isolators

The Transmit and Receive Analog Opto-Isolators consists of an LED (Light Emitting Diode) and a photodiode pair operating in the inframed region of the EM spectrum. A compensation circuit ensures that the performance of a card does not degrade with temperature change or time.

Ring Generator

The Ring Generator receives pulses from the CO side and regenerates a ringing signal at the same frequency and in synchrony with the CO side, which permits selective ringing.

Off Hook Detector

The Off Hook Detector transmits a signal to the CO side to go off hook when the telephone is lifted.

Main Isolator Bias Circuit

The Main Isolator Bias Circuit generates the off hook and ring trip signals, and feeds a -24 V dc (on-hook potential) bias to the Station side telephones. It will feed -48 V to the Station side if the card is powered from -48 V.

Fuse

Fuses F1and F2 (1 A, 125 V Pico Fuse) provide overcurrent protection on the power input.

4. Technical Specifications

4.1 751321

For a listing of the 751321 & 751321/A electrical specifications, refer to Table 1. For a listing of the card's physical specifications, refer to Table 2 and refer to Table 3.

Table 1 Electrical Specifications (measured at 77°F or 25°C, 50% R.H.)

Parameter	Specifications
ISOLATION DATA	
Isolation resistance	100 000 MΩ
Metallic surge	3 kV max
Insulation voltage	50 kV rms (70 kV peak)
INPUT VOLTAGE REQUIREMENT	-24 V or -48 V dc
INPUT POWER REQUIREMENT	
-24 V or -48 V dc	400 mA dc max, with 2 lines ringing, 3 phones each
-24 V or -48 V dc	50 mA dc max, with both lines on-hook
-24 V or -48 V dc	130 mA dc max, with both lines off-hook at 30 mA dc loop current
ON-HOOK	
Ringing generator voltage	84 V rms with 5 ringers (type 500) at 20 Hz
CO side input ringing detection	50 V to 105 V rms, 17 to 50 Hz
Terminal resistance (CO side)	> 5 MΩ at ±100 V dc
OFF-HOOK (40 mA dc)	
Minimum loop current (CO)	20 mA dc
Maximum loop current (CO)	Current limiting at 110 mA dc
Minimum loop current (station)	Will detect off-hook down to 20 mA dc

Parameter	Specifications
Maximum loop current (station)	Current limiting at 60 mA dc
Maximum loop resistance (station, 20 mA dc)	850Ω maximum at -24 V, 1875Ω maximum at -48 V (including telephone)

Table 2 Physical Specifications

Parameter	Specifications
Operating temperature range battery	-4°F to +149°F (-20°C to 65°C)
Height	12” (30.48 cm)
Width	2” (5.08 cm)
Depth	7-7/16” (18.89 cm)
Weight	1.01 lbs (.45 kg)

4.2 751321/A

For a listing of the 751321/A electrical specifications, refer to Table 1 For a listing of the card’s physical specifications, refer to Table 3

Table 3 Physical Specifications

Parameter	Specifications
Operating temperature range battery	-4°F to +149°F (-20°C to 65°C)
Height	12” (30.48 cm)
Width	2” (5.08 cm)
Depth	7-7/16” (18.89 cm)
Weight	0.61 lbs (0.3 kg)

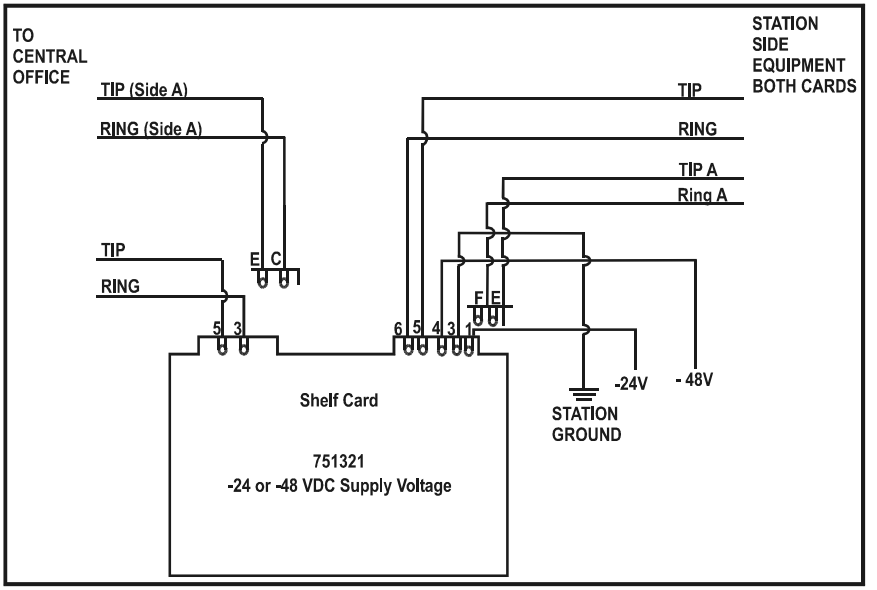
5. Installation

5.1 751321

The Expandable Telephone Card plugs into any slot of the old and new generation Teleline Three, Five, or Eight-card Shelf. However, the card must be installed into the slot which has been pre-wired according to the installation diagram of the specific shelf.

For a view of model 751321, refer to Figure 4.

Figure 4 Expandale Telephone Card, Model 751321



Note

1. An option switch is located on the station side of card to select either -24VDC or -48VDC operation.
2. If the card is supplied with -24V, -21V will be fed on line. If -48V is powering card, -45V is fed on line.
3. Where Caller I.D. and/or Forward Disconnect operations are required a 7501-16 type card must be used.

10 Plug-in Expandable Telephone Card and Add-on

Caution

- Stand on a thick rubber mat and wear rubber gloves during the installation. It is preferable to perform these procedures on a clear dry day when a Ground Potential Rise (GPR) or transients are less likely to occur.
- This card utilizes CMOS circuitry that can be damaged by static electricity procedure. Observe normal CMOS handling procedures to avoid static discharge. Manipulate the card exclusively by the faceplate to prevent any damage to the card and to limit the possibility of electric shock. When moving the card, carry it in an ESD safe container or the antistatic bag, provided with the card. Failure to follow ESD precautions may void the warranty. For further information concerning ESD precautions, contact Positron's Customer Support department.

1. Unpack the Plug-in Expandable Telephone Card from its protective box and shielded anti-static bag.
2. Confirm that the isolation unit is a Expandable Telephone Card by identifying the name and model number on the faceplate of the card.
3. Verify that fuses F1 and F2 are intact. To view the location of the fuses, refer to Figure 1.

   If a fuse is blown contact Positron Customer Support for a card replacement.

4. Set jumper J2 or J3 to -24 V or -48 V depending upon the available shelf voltage.

   The card is factory set to -24 V. To view the location of J2 and J3, refer to Figure 1.

5. The card must be inserted rightside up and may be plugged into the shelf with the power ON or OFF.

   ► Slide the card into its designated pre-wired shelf slot until the two card-edge connectors lock into the Teleline shelf and the retaining clip snaps into place.

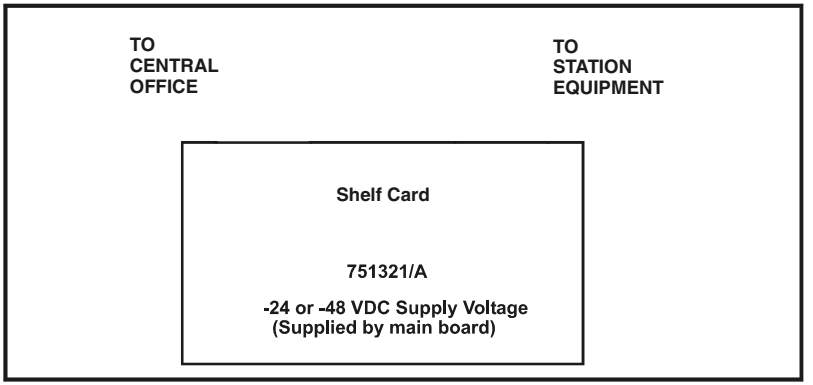
6. Verify the installation by making and receiving a call.

5.2 751321/A

The Expandable Telephone Card Add-On piggybacks onto the 751321 Expandable Telephone Card. The combined card plugs into any slot of the new generation Teleline Three, Five, or Eight-card Shelf. However, the card must be installed into the slot which has been pre-wired according to the installation diagram of the specific shelf.

For a view of the Add-on, model 751321/A, refer to Figure 5.

Figure 5 Expandable Telephone Card, Add-on, Model 751321/A



Note

You cannot upgrade with the 751321/A Add-on if you have an old generation shelf, the 7501-08.

- All circuits connected to this card are done from the 751321 Motherboard card.
- An option switch is located on the station side of the Motherboard card to select either -24VDC or -48VDC operation.
- If the card is supplied with -24V, -21V will be fed on line. If -48V is powering the card, -45V is fed on line.
- Where Caller I.D. and/or Forward Disconnect operations are required a 7501-16 type card must be used.

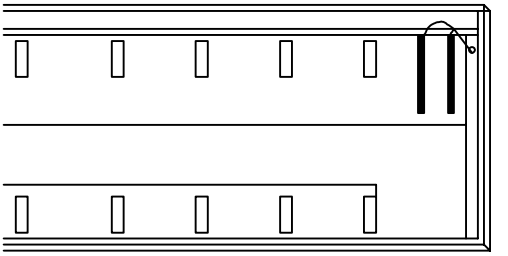
Caution

- Stand on a thick rubber mat and wear rubber gloves during the installation. It is preferable to perform these procedures on a clear dry day when a Ground Potential Rise (GPR) or transients are less likely to occur.
- This card utilizes CMOS circuitry that can be damaged by static electricity procedure. Observe normal CMOS handling procedures to avoid static discharge. Manipulate the card exclusively by the faceplate to prevent any damage to the card and to limit the possibility of electric shock. When moving the card, carry it in an ESD safe container or the antistatic bag, provided with the card. Failure to follow ESD precautions may void the warranty. For further information concerning ESD precautions, contact Positron's Customer Support department.

Note

If the Plug-in Expandable Telephone card is to be installed in slot 8 of the 8 card shelf or slot 5 of the 5 card shelf be sure to push the Station cable to the side, refer to Figure 6.

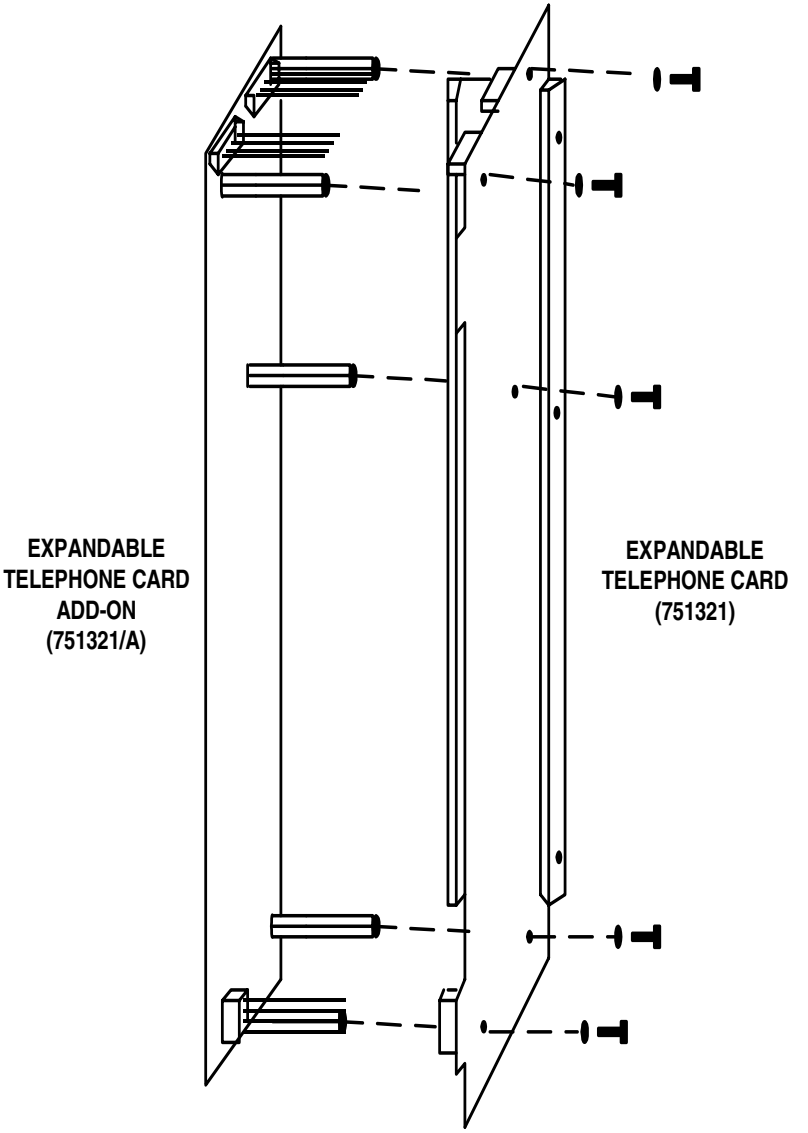
Figure 6 Last Slot of 5 or 8 Card Shelf



1. Install the Expandable Telephone Card Add-on 751321/A on top of the Expandable Telephone Card 751321, refer to Figure 7.
2. Secure the piggyback using the 5 screws and washers kit # 241-010212-401 included with the the 751321/A.
3. The card must be inserted rightside up and may be plugged into the shelf with the power ON or OFF.

   ➤ Slide the card into its designated pre-wired shelf slot until the two card-edge connectors lock into the Teleline shelf and the retaining clip snaps into place.
4. There are no jumpers to set on the Add-on card, it is powered from the 751321.
5. Verify the installation by making and receiving a call on both lines.

Figure 7 Expandable Telephone Card Add-on 751321/A



6. Service and Support

Technical Customer Support

Positron is committed to providing excellent ongoing technical support to its customers. A team of specialists is always available at our Technical Support Center in Montreal for either telephone consultations or on-site visits, to assist Field Technical personnel in the maintenance and troubleshooting of Positron equipment. During normal business hours, (8:30 a.m to 5:00 p.m. EST), any one of our Technical Customer Support (TCS) staff may be reached by dialing 1-888-577-5254 from anywhere in the continental United States or from Canada. Customers outside North America should dial 1-514-345-2200. Staff may also be contacted via fax at 514-345-2271 or e-mail at powerdivision@positron.qc.ca.

Positron TCS staff are available to provide technical assistance and/or to supervise the installation of Positron equipment. Assistance in the planning, configuration, and implementation of the installation will be provided as requested. Arrangements and pricing information regarding field assistance may be obtained by contacting the Technical Customer Support department. Please contact Positron for scheduling at least four weeks prior to the actual requested visit date.

Customer Training

Positron offers full customer training courses, as requested. Seminars are also available on High Voltage Interface (HVI). For more information, contact a customer representative by dialing 1-888-577-5254 or use our e-mail address, powerdivision@positron.qc.ca.

Warranty

Positron warrants that all equipment shall perform in accordance with Positron's specifications. The warranty remains valid for five (5) years from the date of shipment. The warranty will be honored provided that the equipment has not been abused and provided that the equipment has been installed and used in accordance with Positron's installation instructions and specifications. The warranty fully covers workmanship, materials and labor.

This warranty is in lieu of all other warranties, whether expressed or implied, including warranties of merchantability and fitness for a particular purpose. Positron guarantees that all equipment shall perform in accordance with Positron's specifications. Positron disclaims any warranty that Positron

equipment will meet customer requirements beyond the product specification. Positron disclaims any warranty that operations will be uninterrupted or error free.

Repair Service

Positron Inc. offers repair services by which customers can count on timely and quality repairs, regardless of customer location.

All warranty repairs are performed at no cost. Positron reserves the right to repair or replace any equipment which has been found to be defective.

For information about out-of-warranty repairs, contact Positron's Repair department at 1-800-661-4911 (from anywhere in the continental United States or from Canada) or dial 514-345-2228. Due to the varied nature of repairs, no one time frame for turnaround can be guaranteed. However, average turnaround time is two weeks from date of receipt. In emergency situations, special arrangements can be made by contacting our Repair department. All repaired items are warranted for a period of 90 days. Bulk repairs (more than five items) will require additional processing time, therefore, please take this into consideration when requesting a Return Material Authorization (RMA) number.

Before returning any items to Positron for repair, warranty repair or replacement, call the Repair department to obtain an RMA number. Parts returned without RMA numbers cannot be accepted. The RMA number must always be clearly marked on all boxes and crates and on all shipping documents.

Items under warranty are to be shipped prepaid to Positron and will be returned prepaid to the customer. Items that are not under warranty are to be shipped prepaid to Positron and will be returned prepaid with freight charges included on the invoice. Positron cannot accept items shipped collect. A purchase order number is required for all repairs.

To accelerate the repair process, whenever possible, customers should include a report detailing the reason for return with the unit(s) being returned. Also, please include the name and phone number of a person who can be contacted should our Repair department need further information.

When packing items being returned for repair, please ensure that the item(s) is properly packed to avoid further damage. Teleline Isolator cards should never be shipped while installed in a shelf; this will cause damage and will almost invariably extend the repair period.

Ordering Information

Positron's Teleline equipment can be ordered by telephone, facsimile, or by mail. All orders should be directed to the Positron Inside Sales department. Ordering by telephone, or facsimile will eliminate any delays arising from postal services. However, a hard copy purchase order is required as a confirmation. In addition to the model numbers of the items being ordered, the following information is required:

- Company name, contact name and telephone number
- Purchase order number
- "Ship To" address
- "Bill To" address
- Date required on site

All orders must be followed by a confirming order. Equipment will not be shipped until such confirmation is received.

For a list of our contact information, refer to Table 4

Table 4 Positron Contact Information

Address	Positron Inc.
	5101 Buchan St.
	Montreal, Quebec, Canada
	H4P 2R9
Main telephone number	514-345-2200
Customer Service department telephone number	514-345-2200, 1-888-577-5254
General e-mail address	powerdivision@positron.qc.ca
Customer Service department fax number	514-345-2271
TCS department toll-free number	1-888-577-5254
TCS department fax number	514-345-2271
TCS department e-mail address	scarbonaro@positron.qc.ca
Repair department telephone numbers	514-345-2228 or 1-800-661-4911
Customer representative e-mail address	customerservicepower@positron.qc.ca