TeleLite™

Access Interface Card (model 720001)
Description and Installation Guide

925W720107-02E

POSITRON
Positron Inc.

RELEASED

Contents

Chapter 1

General Information

1.1 Publication Information

TeleLite Access Interface Card (model 720001)
Description and Installation Guide
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Positron Inc.
5101 Buchan Street
Montreal, Québec, Canada
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1.2 About this Guide

This guide introduces you to the TeleLite Access interface card, its features and applications, and describes how to install a card in a TeleLite shelf. This guide was designed to be read from beginning to end.

1.2.1 Related Documentation

The other guides in the TeleLite set are listed below. To order any manuals, please contact your customer service representative.

- 720000 TeleLite 6-position Shelf
- 720002 cHVI, 2-position Shelf
- 720013 wall-mounted 3-position Shelf

1.2.2 Positron Products and Services

Positron engineers and manufactures high voltage isolation products to protect personnel and telecommunications circuits in high voltage areas that are susceptible to the effects of Ground Potential Rise (GPR).

Positron is the leader in isolation technology with its Teleline wireline products and TeleLite optical fiber wireline isolation/protection product families. Positron provides total flexibility in product configuration – from standalone units protecting a single circuit to high-capacity, multi-shelf HVI preconfigured systems.

Positron also provides a wide range of consulting, analysis and training services for communications companies and electrical utilities.

Full details and contact information are available at www.PositronPower.com

1.3 Compliance Information

1.3.1 FCC Part 15

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

1.3.2 Product Safety

This equipment is compliant with CSA CAN/CSA-C22.2 No. 60950-1-03

1.3.3 NEBS Compliance

This equipment has been tested and found to comply with the following Telcordia specifications:

- GR-63-CORE
- GR-1089-CORE
- GR-487-CORE

1.4 Service and Support

Table 1: Positron Contact Information

General information:	Positron Inc. 5101 Buchan Street, Suite 220 Montreal, Quebec, Canada H4P 2R9 US and Canada: 1-888-577-5254 International: 1-514-345-2220 Fax: 514-345-2271 E-mail: info@positronpower.com Website: www.positronpower.com
Customer Service and Repairs:	US and Canada: 1-888-577-5254 International: 1-514-345-2220 E-mail: customerservice@positronpower.com

1.4.1 Technical Customer Support

Positron is committed to providing excellent ongoing technical support to its customers. A team of specialists is always available for telephone consultations or for on-site visits to assist in the maintenance and troubleshooting of Positron equipment.

For pricing information or assistance in the planning, configuration and implementation of the installation of equipment, contact Technical Customer Service.

1.4.2 Customer Training

Full customer training courses on High Voltage Interface (HVI) are also available. For more information, contact Positron.

1.4.3 Repair Service

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

For information about out-of-warranty repairs, contact Positron's Repair Department. Due to the varied nature of repairs, no specific turnaround can be guaranteed, but average turnaround time is 20 working days from date of receipt. In emergency situations, special arrangements can be made. All repaired items are warranted for a period of 90 days.

Before returning any items to Positron for repair, warranty repair or replacement, call the Repair department to obtain a Return Material Authorization (RMA) number. Parts returned without RMA numbers cannot be accepted. The RMA number must always be clearly marked on all boxes, crates, and shipping documents. Bulk repairs (more than five items) will require additional processing time, so please take this into consideration when requesting an RMA number.

To accelerate the repair process, whenever possible, include a report detailing the reason for return with the unit(s). 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 they are properly packed to avoid further damage. TeleLite plug-in cards should never be shipped while installed in a shelf; this will cause damage that can extend the repair period.

1.5 TeleLite Warranty

Subject to the provisions of this paragraph, Positron warrants that the equipment shall perform in accordance with Positron's specifications. The warranty remains valid for one (1) year from the date of shipment. The warranty fully covers workmanship, materials and labor. Positron shall, at its sole discretion, repair or replace the problem unit.

Freight costs to ship defective equipment to Positron are borne by the Customer, with return of replaced or repaired equipment to be at Positron's expense.

1.5.1 Limitation of Liability

Subject to anything to the contrary contained herein, Positron's sole obligation and liability and the customer's sole remedy for Positron's negligence, breach of warranty, breach of contract or for any other liability in any way connected with or arising out of, the equipment or any services performed by Positron shall be as follows:

- In all situations involving performance or non-performance of the equipment or any component thereof, the customer's sole remedy shall be, at Positron's option, the repair or replacement of the equipment or said component.
- For any other claim in any other way related to the subject matter of any order under, the customer shall be entitled to recover actual and direct damages; provided that Positron's liability for damages for any cause whatsoever, and regardless of the form of the action, whether in contract or in tort (including negligence), shall be limited to the value of the order.

Positron shall not be obligated to repair or replace any item of the equipment which has been repaired by others, abused or improperly handled, improperly stored, altered or used with third party material or equipment, which material, or equipment may be defective, of poor quality or incompatible with the equipment supplied by Positron, and Positron shall not be obligated to repair or replace any component of the equipment which has not been installed according to Positron specifications.

IN NO EVENT SHALL POSITRON BE LIABLE FOR ANY INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL, PUNITIVE, EXEMPLARY OR SIMILAR OR ADDITIONAL DAMAGES INCURRED OR SUFFERED INCLUDING LOSS OF PROFITS, LOSS OF REVENUES, LOSS OF DATA, LOSS OF

BUSINESS INFORMATION, LOSS OF GOODWILL, LOSS OF EXPECTED SAVINGS OR BUSINESS INTERRUPTION ARISING OUT OF OR IN CONNECTION WITH THE EQUIPMENT, A PURCHASE ORDER SUPPLIES, MAINTENANCE SERVICES OR OTHER SERVICES FURNISHED HEREUNDER, EVEN IF POSITRON HAS BEEN ADVISED OR IS AWARE OF THE POSSIBILITY OF SUCH DAMAGES.

EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT, POSITRON DISCLAIMS ANY FURTHER CONDITIONS, REPRESENTATIONS OR WARRANTIES, WHETHER WRITTEN OR ORAL, EXPRESSED OR IMPLIED, INCLUDING THE CONDITIONS AND WARRANTIES OF MERCHANTABILITY, MERCHANTABLE QUALITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, PERFORMANCE AND THOSE ARISING FROM STATUE, TO THE EXTENT PERMITTED BY LAW. POSITRON DOES NOT WARRANT THAT THE SYSTEM WILL OPERATE WITHOUT INTERRUPTION OR THAT IT WILL BE ERROR FREE.

1.5.2 Cancellation and Rescheduling Charges

Should the customer cancel, prior to shipment, any part of an order, the customer agrees to pay to Positron cancellation charges, not as a penalty, which shall total all expenses, including labor expenses, incurred by Positron prior to said cancellation. Equipment that has been specially developed for the customer's specific applications shall not be subject to cancellation. Cancellation or rescheduling is not permissible after shipment of the System.

Chapter 2

Overview

2.1 TeleLite System Introduction

TeleLite provides electrical isolation between two points on a telecom landline. Its purpose is to increase electrical isolation between the CO (Central Office) side and Station side. The increase in electrical isolation is achieved by using a fiber optic link. The Station side unit is located either inside or outside the building. The CO side must be located far enough from the Station side so that the GPR does not increase above 300 V with respect to the CO.

The TeleLite system is divided into two parts: the CO side unit and the Station side unit. Each unit is composed of one shelf. Each shelf has six slots for line cards and one slot for a power connection. The shelf backplane does not provide for any telecom connection since all connections (except local power) will be made directly to the RJ-11/RJ-45 connectors, located on the front panel of each card.

The communications link between the CO side unit and the Station side unit supports two types of fibers, single-mode or multi-mode, depending on the customer installation. For information, see section 2.1.1 on page 15.

NOTE The appropriate fiber type must be used for each line card (multi-mode or single-mode).

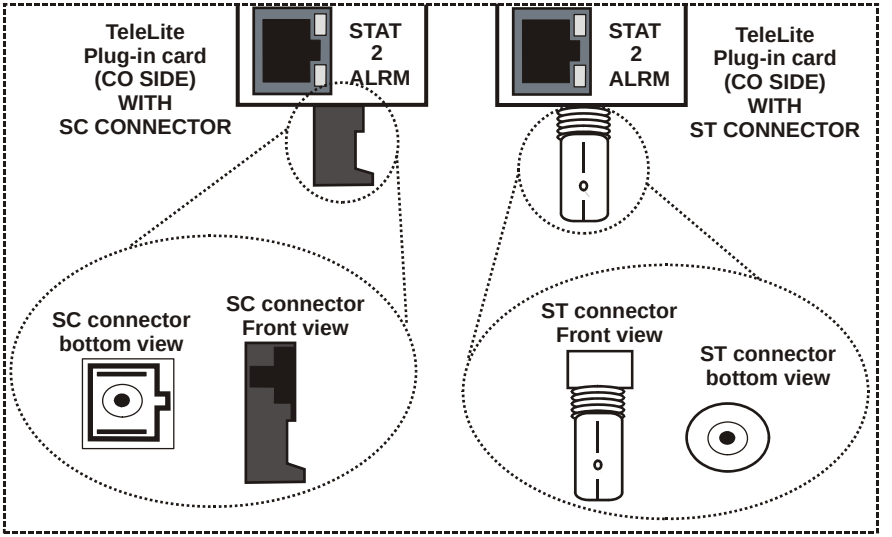
2.1.1 Fiber Connectors

The fiber interface is located on the bottom front panel of each line card (except for the TeleLite Access interface card). Each of these fiber interfaces will support one of two types of fiber connectors: ST or SC.

Table 2: Fiber Connectors

Fiber Connector	Description
SC	A plastic snap-on optical connector.
ST	An optical fiber connector used to join single fibers together at interconnects, or to connect them to optical cross connects.

Figure 1: SC and ST Fiber Connector Types



2.1.1.1 Multi-Mode fiber type

For short distances, less than 2 km (1.2 miles), the fiber type will be multi-mode using an 850 ηm wavelength LED.

2.1.1.2 Single-Mode fiber type

For longer distances, up to 16 km (9.9 miles), the fiber type will be single-mode using a 1310 ηm wavelength laser.

2.2 Introduction to the Access Interface Card

The Access interface card (model 720001) can be housed in any one slot of any TeleLite shelf. This card provides:

- Electrical connection between the backplane and the Station side -48 Vdc
- Fuse and alarm contact
- Protection against polarity reversal and transient

NOTE The recommended power supply is -48 Vdc, 2 A.

2.2.1 Fuse and Alarm Contact

The Access interface card on the Station side and on the CO side (if provisioned) have Return and -48 V pins to provide power to the shelf. It also has a fuse alarm pin that provides -48 V when the Access interface card fuse is blown. This provisions for an external alarm indication.

2.2.2 Local Alarm 1 and Local Alarm 2

If any circuit card on the Station side shelf experiences a fault condition, the local alarm relay contact (normally open) between pins (local alarm 1 and local alarm 2) will close, allowing current to flow through an externally provided circuit. This mechanism can be used to provision an audio or visual indication of a fault condition.

2.2.3 Remote Alarm 1 and Remote Alarm 2 (optional function)

If any circuit on the CO side shelf experiences a fault condition, this indication is communicated over the fiber to the Station side shelf Access interface card. The remote alarm contact between pins (remote alarm 1 and remote alarm 2) will close, allowing current to flow through an externally provided circuit. This mechanism can be used to provision an audio or visual indication of a fault condition.

NOTE The local and remote alarm pins on the Access interface card on the CO side (if provisioned) are not used since the equipment is located at the mid span, where typically there is no equipment to monitor alarms.

Figure 2: Access Interface Card Terminal Block (CO and Station side)

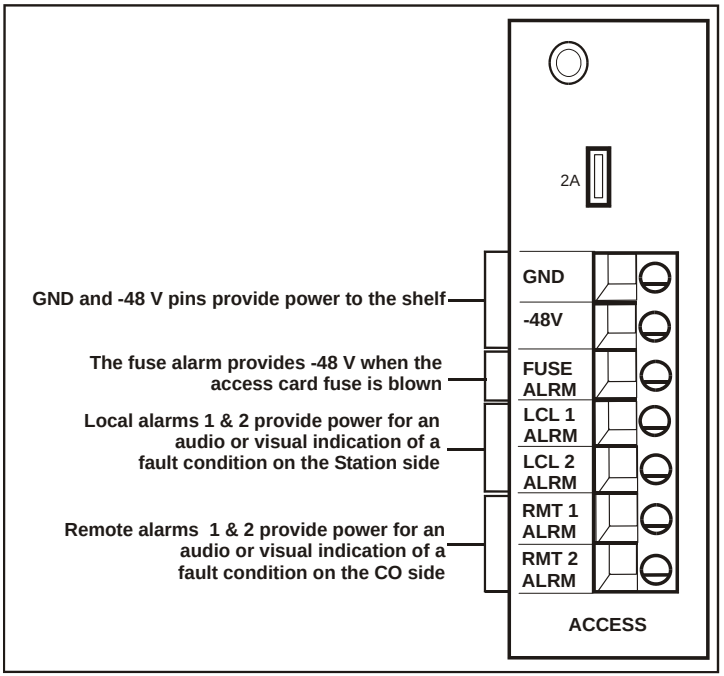


Table 3: Access Card Pinouts

Terminal Block	Station Side Function	CO Side Function
RTN	Supplies -48 Vdc Return	Supplies -48 Vdc Return
-48 V	Supplies -48 Vdc	Supplies -48 Vdc
Fuse Alarm	Provides -48 Vdc when fuse is blown	Provides -48 Vdc when fuse is blown
Local Alarm 1	Normally open relay contact provides dry contact closure for an audio or visual indication of a fault condition on the Station side	Not used
Local Alarm 2	Normally open relay contact provides dry contact closure for an audio or visual indication of a fault condition on the Station side	Not used
Remote Alarm 1	Normally open relay contact provides dry contact closure for an audio or visual indication of a fault condition on the CO side	Not used
Remote Alarm 2	Normally open relay contact provides dry contact closure for an audio or visual indication of a fault condition on the CO side	Not used

NOTE The TeleLite Access interface card requires a 2 A fuse. The fuse is replaceable. For ordering information, see section 1.4 on page 9.

NOTE The power to the Access interface card is polarity sensitive. No damage incurred, but system does not work if polarity is wrong.

CAUTION For continued protection against risk of fire, replace only with same type and rating of fuse.

2.3 Specifications

Table 4: Environmental Specifications

Parameter	Specification
Operating Temperature	-40°C to 65°C (-40°F to 149°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity (non-condensing)	20 to 80%
Altitude	-61 to 3048 m (-200 ft to 10,000 ft) above sea level

Table 5: Electrical Specifications

Parameter	Specification
Shelf Voltage Input	-40.8 Vdc to -57.6 Vdc
Shelf Maximum Current	1 A
Alarm Contact Rating	62.5VA, 125Vac, 2A

NOTE The operating temperature specified above is the maximum ambient temperature with any combination of TeleLite cards in the shelf.

Chapter 3

Installation

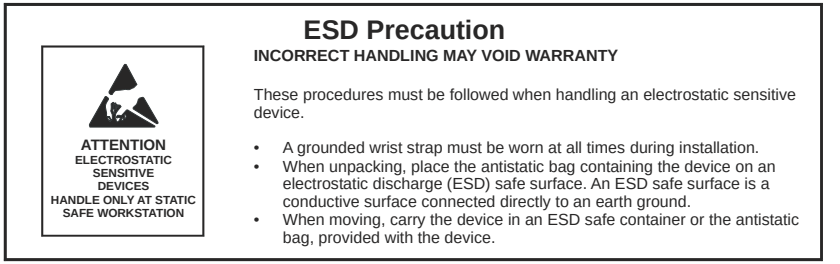
3.1 Installing an Access Interface Card in a Shelf

After a shelf has been properly installed and all the wiring is complete, the TeleLite Access interface card can be installed.

NOTE For information on how to install a shelf, see the TeleLite Shelf Description and Installation guide for the appropriate shelf. For ordering, see section 1.4 on page 9.

Follow the ESD precautions shown in Figure 3.

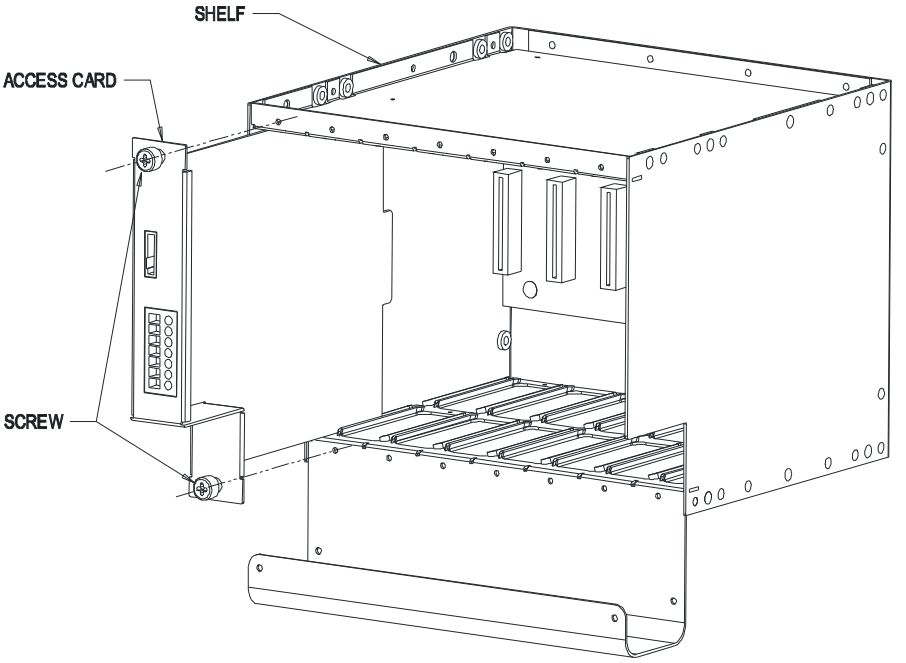
Figure 3: ESD Precautions



› **To Install an Access Interface Card in a Shelf**

1. Remove the card from its protective packaging.
2. Make sure the card is right-side up, align the card with the appropriate slot of the shelf and slide it in, as shown below. In this figure the card is depicted in the first slot, but the Access interface card can be installed in any slot. In all our pre-configured HVI assemblies (not shown here), the Access Interface card is installed in the seventh slot to facilitate the power connections.
3. Hand-tighten the top and bottom screws, to secure the card in place.
4. Connect the power and alarm connector on the terminal block kit.

Figure 4: Installing an Access Interface Card in a Shelf



3.2 Serving Cable

CAUTION

The serving cable to the CO unit must be routed and installed according to local regulation.

The CO unit must be installed outside the state ground where the potential is less than 300 V.

Use a fiber and conduit between the CO and Station side unit that is non-conductive and follows local regulations.

3.3 Earthing Connector

CAUTION

To ensure safety of personnel, Positron recommends following these guidelines:

- The return of the DC supply must be grounded at the source.
- This equipment must be permanently connected to earth (Refer to the Description and Installation guide for the appropriate TeleLite Shelf. Documentation is available online at www.PositronPower.com or for ordering, see section 1.4 on page 9.)
- The field wiring should include a readily-accessible disconnect device. The disconnect device shall disconnect both poles (-48 Vdc and RTN).
- This equipment is connected directly to the DC supply system earthing electrode conductor or to a bonding jumper from an earthing terminal bar or bus to which the DC supply system earthing electrode is connected.
- This equipment must be located in the same immediate area (such as adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same DC supply circuit and the earthing conductor, and also the point of earthing of the DC system. The DC system shall not be earthed elsewhere.
- The DC supply source must be located within the same premises as this equipment.
- There shall be no switching or disconnecting devices in the earthed circuit conductor between the DC source and the point of connection of the earthing electrode conductor.

3.4 Troubleshooting

Before calling customer service, make sure that:

- The card is properly inserted
- The fuse is not blown
- 48 Vdc is available on the terminal block

If all of the above are verified, the problem may be line-related. Refer to the Description and Installation guide for the plug-in line card. Documentation is available online at www.PositronPower.com or for ordering, see section 1.4 on page 9.)

Appendix A

Acronyms

Acronyms

ALRM	Alarm
CO	Central Office
CSA	Canadian Standards Association
DC	Direct Current
ESD	Electro Static Discharge
FCC	Federal Communications Commission
GPR	Ground Potential Rise
HVI	High Voltage Interface
LCL	Local
LED	Light Emitting Diode
RMA	Return Material Authorization
RMT	Remote
RTN	Return