

TeleLite™

cHVI 2-slot 1U Shelf (720002) Description and Installation Guide

925W720108-02E



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Chapter 1

General Information

1.1 Publication Information

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1.2 About this Guide

This guide introduces you to the TeleLite cHVI 2-slot 1U Shelf, and describes how to install it. 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.

- TeleLite Description and Installation Guide
- TeleLite System Overview

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, public safety and security organizations and electrical utilities.

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

1.3 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

1.3.1 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.

1.3.2 Customer Training

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

1.3.3 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.

1.4 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.

1.4.1 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.

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1.4.2 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 cHVI 2-slot 1U Shelf Introduction

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:

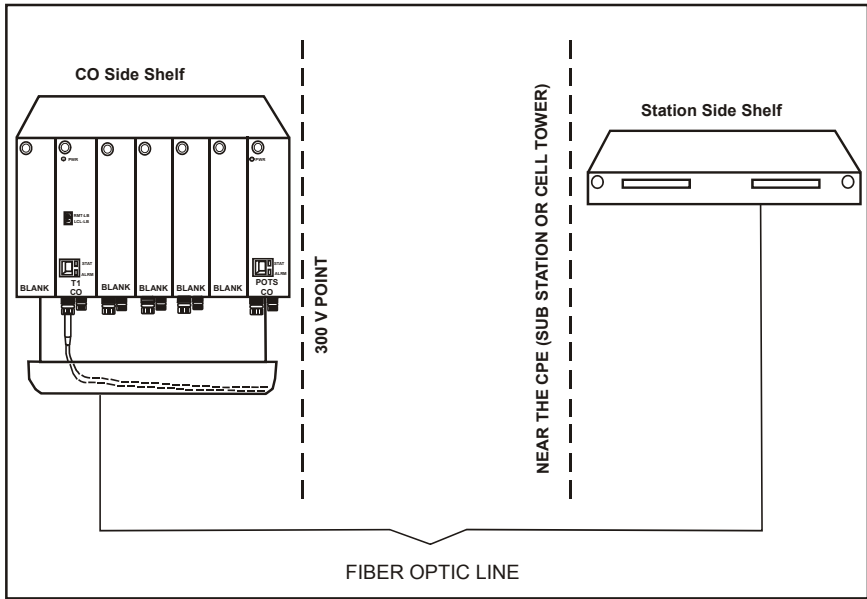
- Two slots for plug-in line cards.
- A motherboard, which provides power and alarm connections only.
- All telecom connections will be made directly to the RJ-11/RJ-45 connectors, located on the front panel of each card then routed through the back of the shelf.
- All fiber connections are made directly to the fiber optic connectors located on the front panel of each card, then routed through the back of the shelf.

The TeleLite cHVI 2-slot 1U Shelf is for indoor use only, and is designed for Station side installation. If the CO side installation is located indoors, this shelf can be used.

NOTE

For an illustration of a CO side and Station side shelf layout, see Figure 1 on page 15.

Figure 1: Example of a TeleLite cHVI 2-slot 1U Shelf Used With a 6-position CO side Shelf



2.2 Motherboard

The motherboard is located inside the shelf. It has two identical edge connectors, one for each card slot. Each connector provides power and alarm connections.

For a list of CO and Station side pinout functions, see Table 2 below.

NOTE

When used in an indoor CO side installation, the motherboard in the CO side shelf and the motherboard in the Station side shelf are the same.

Table 2: Motherboard Edge Connector Pin-outs

Pin Number	Function (CO Side)	Function (Station side)
1	Chassis	Chassis
2	Chassis	Chassis
3	NC	NC
4	NC	NC
5	RTN	RTN
6	RTN	RTN
7	-48 Vdc	-48 Vdc
8	-48 Vdc	-48 Vdc
9	Not used	Local Alarm (normally open)
10	Not used	Local Alarm (normally open)
11	Not used	Remote Alarm (normally open)
12	Not used	Remote Alarm (normally open)
13	Spare	Spare
14	Spare	Spare
15	Spare	Spare
16	Spare	Spare
17	NC	NC
18	NC	NC
19	Chassis	Chassis
20	Chassis	Chassis

2.2.1 The Integrated Access Interface

The integrated access connector into the 720002 shelf 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.

2.2.2 Fuse and Alarm Contact

The access connector on the Station side and on the CO side (if provisioned) has 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 fuse is blown. This provisions for an external alarm indication.

2.2.3 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.

2.2.4 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 connector. 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 Shelf Access Connector 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: Shelf Access Connector

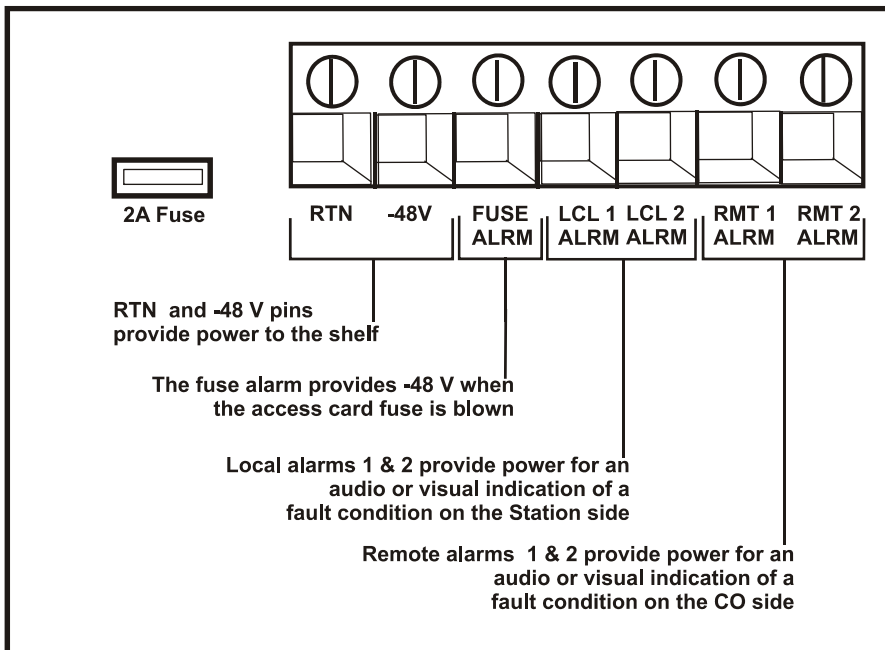


Table 3: Access Connector Pinouts

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 integrated Access interface requires a replaceable 2A fuse. For ordering information, see section 1.3.1 on page 8.

CAUTION

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

NOTE

The power to the integrated Access interface is polarity sensitive. If the polarity is wrong, no damage should occur, but the system will not work.

2.3 Expansion Connector

At the rear of the unit, a flat cable connector is provided to daisy-chain up to three shelf. The power signal and alarms are routed via this cable. If a power supply is inserted in the first shelf such as the 721123 (TeleLite Power Supply), this daisy chain cable will bring to power to the two others shelf.

Therefore, if three shelves are connected together, only one power supply unit is required in the first shelf.

The daisy chain cable product number is 720002-DC and is ordered separately.

2.4 Installation Bracket Kit

The TeleLite cHVI 2-slot 1U Shelf can be wall-mounted or installed on a 19" rack using the supplied brackets.

NOTE

For installation on a 23" equipment rack, a 23" bracket kit must be ordered.

2.5 Shelf Specifications

Table 4: Environmental Specifications

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

Table 5: Mechanical Specifications

Parameter	Specification
Shelf Dimensions (approx.)	27.9 cm (11") deep x 1U high, 48.3 cm (19") wide for 2 slots
Shelf Weight	1.56 kg (3.45 lbs)
Shelf Material	Aluminium
Number of Slots	2

Table 6: Electrical Specifications

Parameter	Specification
Shelf Power Input	-40.8 Vdc to -57.6 Vdc
Alarm Contact Rating	Dry contact 62.5 VA 125 Vac. 2 A (Station side only)

Chapter 3

Installation

3.1 Installation Options

The 2-slot 1U Shelf must be installed indoors with appropriate mounting kits.

The shelf can be mounted on one of the following:


- On a 19" rack
- On a 23" rack with an optional mounting kit.
- On a wall

3.2 Installing the 2-slot 1U Shelf

The shelf must be properly installed before plug-in cards can be inserted.

Follow the safety precautions shown in Figure 3.

Figure 3: ESD Precautions

 <p>ATTENTION ELECTROSTATIC SENSITIVE DEVICES HANDLE ONLY AT STATIC SAFE WORKSTATION</p>	<p style="text-align: center;">ESD Precaution</p> <p style="text-align: center;">INCORRECT HANDLING MAY VOID WARRANTY</p> <p>These procedures must be followed when handling an electrostatic sensitive device.</p> <ul style="list-style-type: none">• A grounded wrist strap must be worn at all times during installation.• When unpacking, place the antistatic bag containing the device on an electrostatic discharge (ESD) safe surface. An ESD safe surface is a conductive surface connected directly to an earth ground.• When moving, carry the device in an ESD safe container or the antistatic bag, provided with the device.
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NOTE

Note the following pre-mounting considerations for all shelf installations:

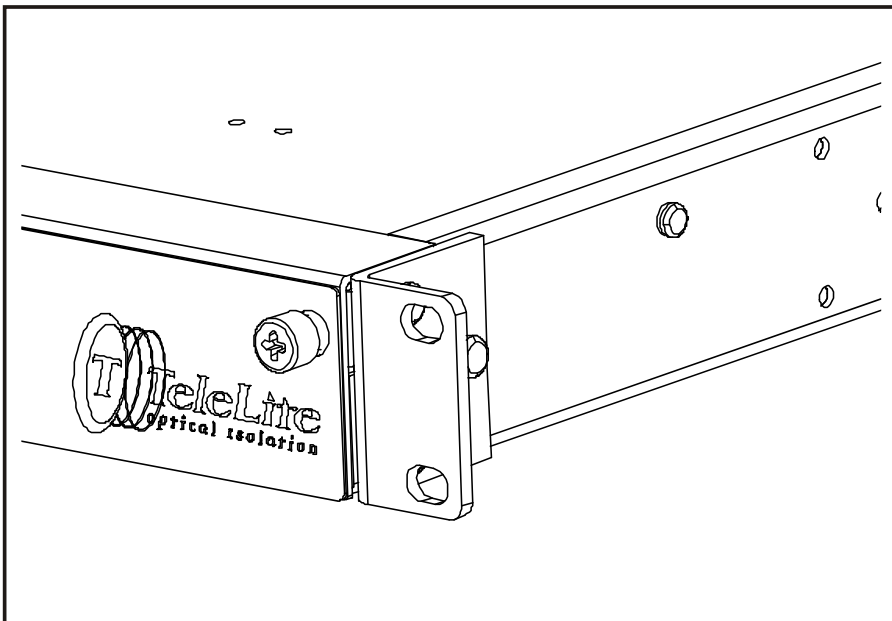
1. Installations should conform to local practices.
2. Equipment must be installed in a restricted area.
3. The CO side must be located far enough from the Station side so that the GPR does not increase above 300 V with respect to the CO.
4. Minimum aisle clearance of 76 cm (2' 6") is required in front of the equipment. Rear access is necessary for power and alarm connections and for telecom and fiber cable routing.
5. Equipment should not be installed in the direct path of air conditioning or heating ducts. Use a deflector plate to direct airflow away from equipment, if necessary.
6. Equipment temperature is between -40°C to 65°C (-40°F to 149°F).
7. AC power should be available for test equipment, power tools, etc.
8. Adequate lighting should be provided.
9. Local power of 48 Vdc is required.
10. A fuse and alarm panel may be required.

3.2.1 Installing the 2-slot 1U Shelf in an equipment rack

► **To Install the shelf in an equipment rack**

1. The shelf is shipped with the brackets for 19" rack mounting.
2. To mount the shelf on a 23" equipment rack, remove the two screws on each 19" bracket, install the brackets for the 23" rack and tighten, making sure the screws are firmly secured.

Figure 4: Brackets for Rack-mount Installation



NOTE

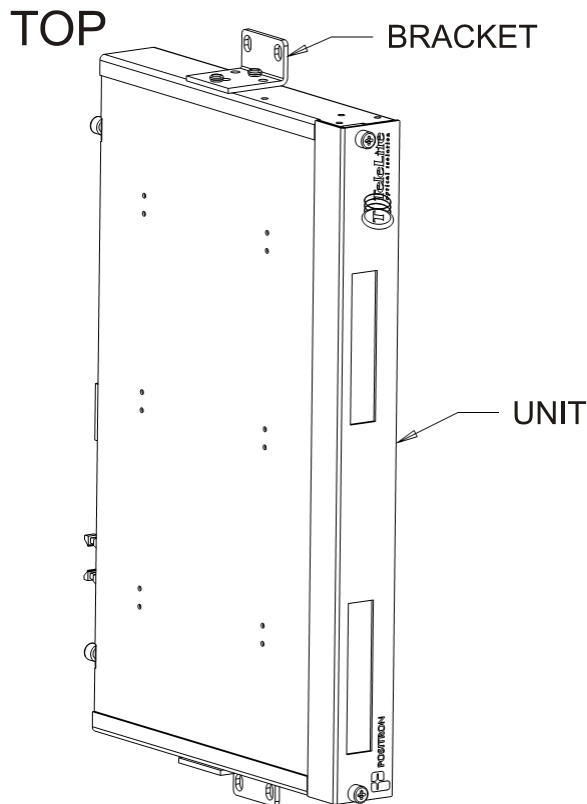
The shelf is shipped with the brackets for 19" rack mounting (shown). Brackets for 23" rack mounting must be ordered separately.

3.2.2 Installing the 2-slot 1U Shelf on a wall

► To Install the shelf on a wall or backboard

1. The shelf is shipped with the brackets for 19" rack or wall-mounting.
2. To mount the shelf on wall, remove the two screws on each supplied 19" bracket, and relocate the brackets as shown, then tighten, making sure the screws are firmly secured.

Figure 5: Brackets repositioned for wall-mount installation



3.3 Grounding the 2-slot 1U Shelf

The TeleLite shelf comes with a two-hole crimp ground lug.

Locate a green-yellow to #10 AWG ground wire and a single-hole lug (this hardware is not provided).

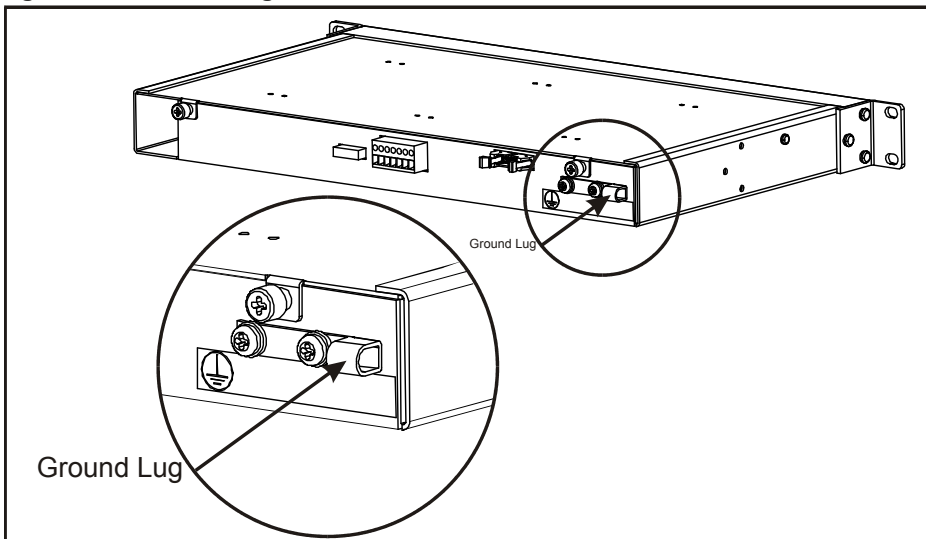
CAUTION

HIGH VOLTAGE CURRENT: Earth ground connection is essential before making any telecommunication network connections.

NOTE

- All shelves must be permanently connected to earth.
- The ground wiring must be green-yellow to #6 AWG.

Figure 6: Ground Lug Location for a Rack-mount Installation



► To Ground a Shelf

1. Mount the shelf.
2. Crimp the ground wire to the ground lug
3. Connect the ground lug to the shelf using the hardware provided in the installation kit.
4. Connect the ground wire to one of the following:
 - The 19" or 23" rack with separate screw, star washer and nut (this hardware is not provided)
 - Earth ground
 - Power supply common ground
5. Stick the label (provided in the installation bracket kit) on the same side of the shelf as the ground lug.

NOTE

The ground lug is located on the back of the shelf.

Appendix A

Acronyms

A 1 Acronyms

AC	Alternating Current
AWG	American Wire Gauge
cHVI	Compact High Voltage Interface
CO	Central Office
DC	Direct Current
ESD	Electro-Static Discharge
HVI	High Voltage Interface
PBX	Private Branch Exchange
FXO	Foreign Exchange Originating
FXS	Foreign Exchange Subscriber
GPR	Ground Potential Rise
LCL	Local
LED	Light-emitting Diode
LOS	Loss of Signal
NC	No Connection
POTS	Plain Old Telephone Service
RMA	Return Material Authorization
RMT	Remote
RTN	Return
RX	Receive
TX	Transmit