



4-W T1 CXR Isolation Card  
With 48V/130V Span Powering

Description & Installation  
P30143

## Table of Contents

1.0	PRODUCT SCOPE	3
2.0	PRODUCT OVERVIEW	3
2.1	System Requirements	3
2.2	Intended Uses	3
3.0	PRODUCT FEATURES	3
3.1	Transformer Isolation	3
3.2	Termination of Simplex Sealing Current	4
3.3	Provide Span Powering	4
4.0	INSTALLATION	4
4.1	Setting Switches	4
4.2	Accessing Remote Ground	5
4.3	Insertion of Card	5
4.4	Power Connection	6
5.0	PHYSICAL CHARACTERISTICS	
5.1	Mechanical Configuration	6
5.2	Environmental Requirements	6
6.0	SPECIFICATIONS	6
Table 1	Isolation Specifications	6
Table 2	External System Input Requirements	6
Table 3	External System Input Parameters/Specifications	7

## **1.0 PRODUCT SCOPE**

This document describes the specifications, requirements and installation instructions for the SNC Lyte Lynx® P30143 transformer-based, 4-Wire, T-Carrier Data Isolation card. It provides an understanding of the basic functions and features available with these products.

## **2.0 PRODUCT OVERVIEW**

### **2.1 System Requirements**

The P30143 isolation card is designed for installation in an SNC Lyte Lynx® or Teleline Isolator\* Card Shelf. No powering is required for these passive devices. However, if a span powering is required to operate the termination equipment or HDSL remote unit, the remote side and the station side of this data card should be powered.

### **2.2 Intended Uses**

This Data Isolation Interface model provides an isolated interface for 4-wire DS1 (such as T1) data circuits, including SuperFrame, Extended SuperFrame, and single or multi-channel DS0 transmission, as well as any other digital channel with a primary signaling frequency in the 10kHz - 2MHz range. Frequency response is 2kHz - 6MHz.

The primary function of these cards is to provide isolation from hazardous voltages while being “transparent” in the circuit. All data signaling information within the specified frequency bandwidth will be unaffected. However, DC signaling is not supported. A secondary function is to provide for the loopback of DC simplex sealing current/repeater powering current on the remote (Central Office) side since there is no DC path for such current through the unit.

Lyte Lynx® systems are intended for use at power substations and similar locations where high voltage isolation is required on the incoming copper telecom pairs to protect the network from harm and to provide a personnel safety barrier against voltages. This specifically includes protection from longitudinally induced voltage surges and Ground Potential Rise (GPR) that may occur during power system faults.

## **3.0 PRODUCT FEATURES**

### **3.1 Transformer Isolation**

The P30143 Lyte Lynx® data isolation interface model is a passive, magnetic-coupled device. Primary to secondary isolation is rated at 65kV BIL. The transformers have been tested and proven capable of handling 1000 + amps of drainage current for four milli-seconds. The isolation card’s purpose is to protect the customer’s station equipment. They are sufficiently robust to do the job without gimmicks to “protect the protector.”

\*Teleline Isolator is a trademark of Positron Industries Inc.

### 3.2 Termination of Simplex Sealing Current

This card provides termination of simplex sealing or span line powering current from 10-20mA on the CO/Remote side. The remote side center taps of the two transformers are set to connect to each other via a power resistor to limit the sealing current to 10mA - 20mA (See section 4.1 and Figure 1).

### 3.3 Provide Span Powering

The card also provides simplex sealing or span line powering current from up to 20mA of current on the station side for the purpose of powering the repeater or customer termination equipment. The Tip and Ring of the transmitting wire pair are positive and the Tip1 and Ring1 of the receiving pair are negative. The output voltage level can be either 130V or 190V depending on the setting of the SW3 switch on the station side of the card.

## 4.0 INSTALLATION



**WARNING:** DO NOT connect center taps of CO/Remote and Station sides of transformers together. Doing so would disable the isolation interface and create a hazardous situation.



**WARNING:** To provide personnel isolation from local ground, stand on a thick rubber mat and use other adequate insulation devices (rubber gloves) when working on the isolation system.



**CAUTION:** The incoming telephone pairs should be contained in insulated conduit (PVC, etc.) or the pair should be jacketed with sufficient insulation to withstand a voltage rise from ground fault potential and from fault induction voltage.

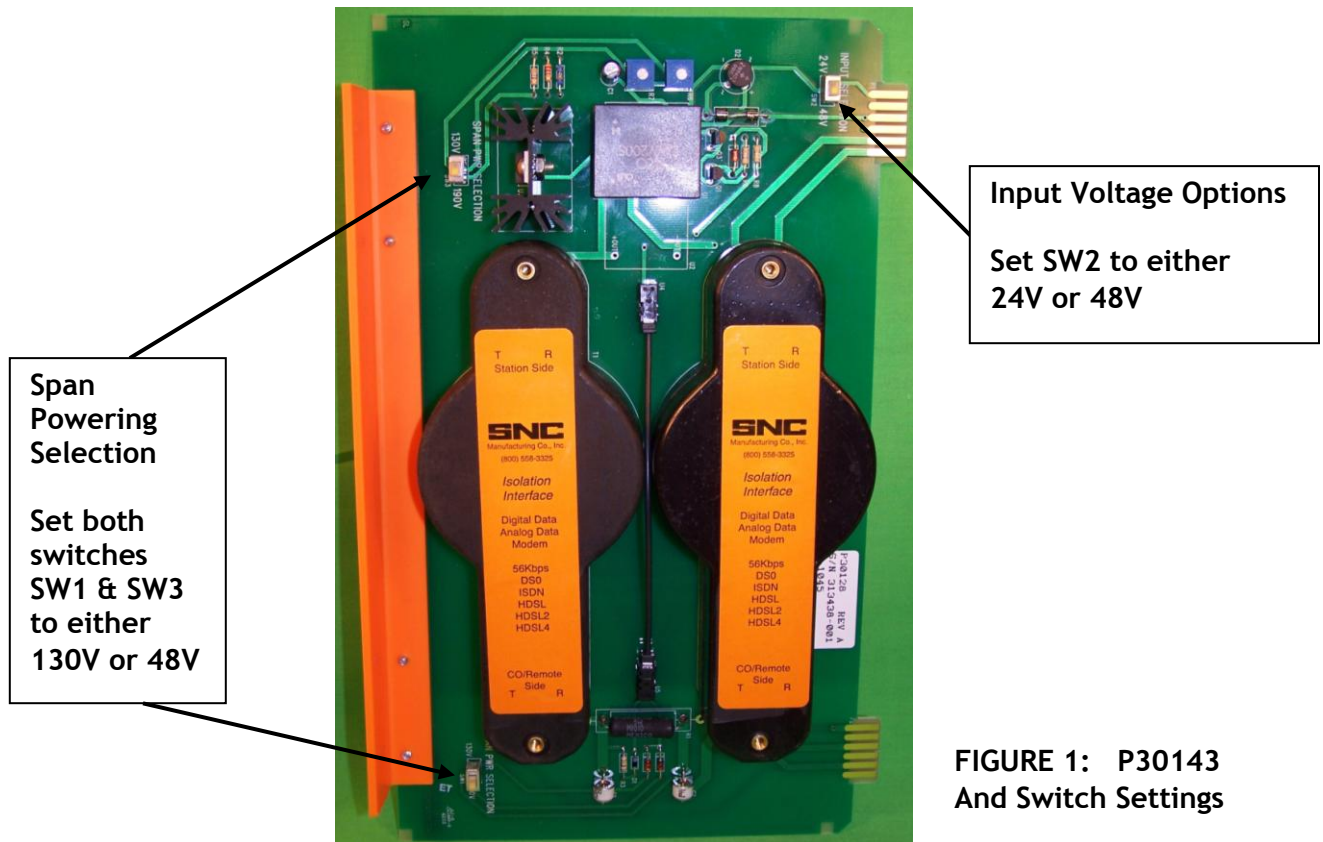


**CAUTION:** Any metallic shielding on the incoming CO/Remote pairs must be isolated from substation grounds all the way from the network low voltage interface (300 volt peak GPR point per IEEE Standard 487) to the entry into the card shelf. The conductors must also be isolated.

### 4.1 Setting Switch SW1, SW2 & SW3

Switch SW2 is provided on the P30143 card to select the available input voltage on the card shelf. If the available voltage is -24V, set the switch to 24V position. If the available voltage is -48V, set the switch to 48V position. (See Figure 1)

Switch SW1 and SW3 are made available for selection of span powering voltage. If the span powering voltage required of the telecommunication equipment is 130V, set switch SW1 and SW3 to 130V. If the span powering voltage required of the equipment is 48V, set both switch SW1 and SW3 to 48V. (See Figure 1)



**Span Powering Selection**

Set both switches SW1 & SW3 to either 130V or 48V

**Input Voltage Options**

Set SW2 to either 24V or 48V

**FIGURE 1: P30143 And Switch Settings**

#### 4.2 Accessing Remote Ground

On remote side, the center taps of the individual transformers are each connected to a separate 2-electrode 350-volt gas tube with a high holdover voltage rating. The other side of the gas tubes should be connected to a 5kV spark gap bus, and then to CO/Remote ground via the dedicated cable shield. The card accesses remote ground on the lower backplane when plugged into the lower backplane edge connector. (See document that comes with the card shelf for details on terminating remote ground)

#### 4.3 Insertion of Card

The P30143 isolation card requires an installed SNC Lyte Lynx® or Teleline Isolator\* card shelf. With the card shelf installed and properly configured, slide the isolation card into any available slot and firmly plug it into the card shelf backplane receptacles. **This should be done without power applied to the card shelf.**

\*Teleline Isolator is a trademark of Positron Industries Inc.

#### 4.4 Powering The Card

To power station side circuitry of the P30143 card, a **grounded -24VDC** or **-48VDC** voltage must be available on the card shelf. For proper connection, please refer to the appropriate documentation that comes with the card shelf being used. (T0355 for 3-Slot, T0395 for 6-Slot, or T0349 for 12-Slot card shelf). The remote side must also be powered by the span powering from the CO unit.



**CAUTION:** All station terminal apparatus should be on the same ground grid when the station ground is connected in the isolation card shelf.

### 5.0 PHYSICAL CHARACTERISTICS

#### 5.1 Mechanical Configuration

Mechanical stability is provided by two separate backplanes in the card cage, one on the substation side and one on the remote side. The Isolation Cards are two-sided printed circuit boards manufactured in accordance with the appropriate PCB standards.

#### 5.2 Environmental Requirements

The P30143 Isolation Cards may be installed in an indoor or moderate outdoor environment and are guaranteed operable in temperatures ranging from -40°C to 100°C (-40°F to 212°F) under humidity conditions from 0-99 percent.

### 6.0 SPECIFICATIONS

<b>Table 1: Isolation Specifications</b>	
Longitudinal Surge (1.2 x 50 micro-sec)	65 kV peak
Continuous Rating	20 kV rms

<b>Table 2: External System Input Requirements</b>	
<b>Input Specification</b>	<b>Requirement</b>
Signal Source & Termination Impedances	100 -135 Ohm
Loop Attenuation (sum of remote side and station side loops)	34 dB Max

**Table 3: External System Input Parameter/Specifications**

<b>PARAMETER</b>	<b>SPECIFICATIONS</b>
Longitudinal Balance: 10 kHz - 5 mHz	>60 dB
Return Loss 772 kHz @ 100 Ohms	>14 dB
Return Loss 135 Ohm Source Impedance 2.4 kHz 32 kHz	>14 dB >18 dB
Message Circuit Noise (Idle Channel Noise)  1.2k - 4000 Hz @ 600 Ohms	<0 dB <sub>BrnC</sub>
Phase Jitter	<1P p-p
Signal to NOISE Ratio	>50 dB
Insertion Loss 772 kHz @ 100 Ohms	<0.1 dB <sub>m</sub>
Frequency Response  Relative to 772 kHz @ 100 Ohms; +3.0 dB	2 kHz - 6 MHz
Crosstalk (to adjacent channel)	< -45 dB
TEMPERATURE RANGE	-40 to +100° C (-40 to 212° F)
HUMIDITY RANGE	0 to 99% Relative Humidity
DRAINAGE CAPACITY - Minimum	0.5 Amps continuous (400 A2S Surge Drainage Rating)

For further information or for technical support - call 800-558-3325  
or visit [www.sncmfg.com](http://www.sncmfg.com)



**SNC Manufacturing Co., Inc.**  
101 West Waukau Ave., Oshkosh, WI 54902-7209  
800-558-3325 or 920-231-7370 FAX 920-231-1090  
E-mail: [telecom@sncmfg.com](mailto:telecom@sncmfg.com)  
Website: [www.sncmfg.com](http://www.sncmfg.com)