



4-W HDSL/56Kbps Isolation Card  
With 130/190V Span Powering

Description & Installation  
P30140

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## 1.0 PRODUCT SCOPE

This document describes the specifications, requirements and installation instructions for the P30140 SNC Lyte Lynx® transformer-based, 4- wire, 56 kbps Data Isolation Card. It provides an understanding of the basic functions and features available with this product.

## 2.0 PRODUCT OVERVIEW

### 2.1 System Requirements

The P30140 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 model provides an isolated interface for 4-wire digital or analog data circuits while providing span power toward the customer equipment. Types of digital circuits protected include rates of 2.4 kbps to 72 kbps as used in services such as Synchronet, Basic Rate ISDN and HDSL carrier frequencies. Types of analog circuits protected include rates of 100 Hz to 200 kHz as used in analog carrier, modems, SCADA, tone relay control and tone signaling.

The primary function of the card is to provide isolation from hazardous voltages while being “transparent” in the circuit. All signaling information within the specified frequency bandwidth will be unaffected. However, DC signaling is not supported. A secondary function is to provide termination for the loopback of DC simplex sealing current or repeater powering on the remote (Central Office) side. A DC path for such current through the unit is provided.

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 equipment from harm and to provide a personnel safety barrier against voltages within the limits of the isolator. 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 P30140 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 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.

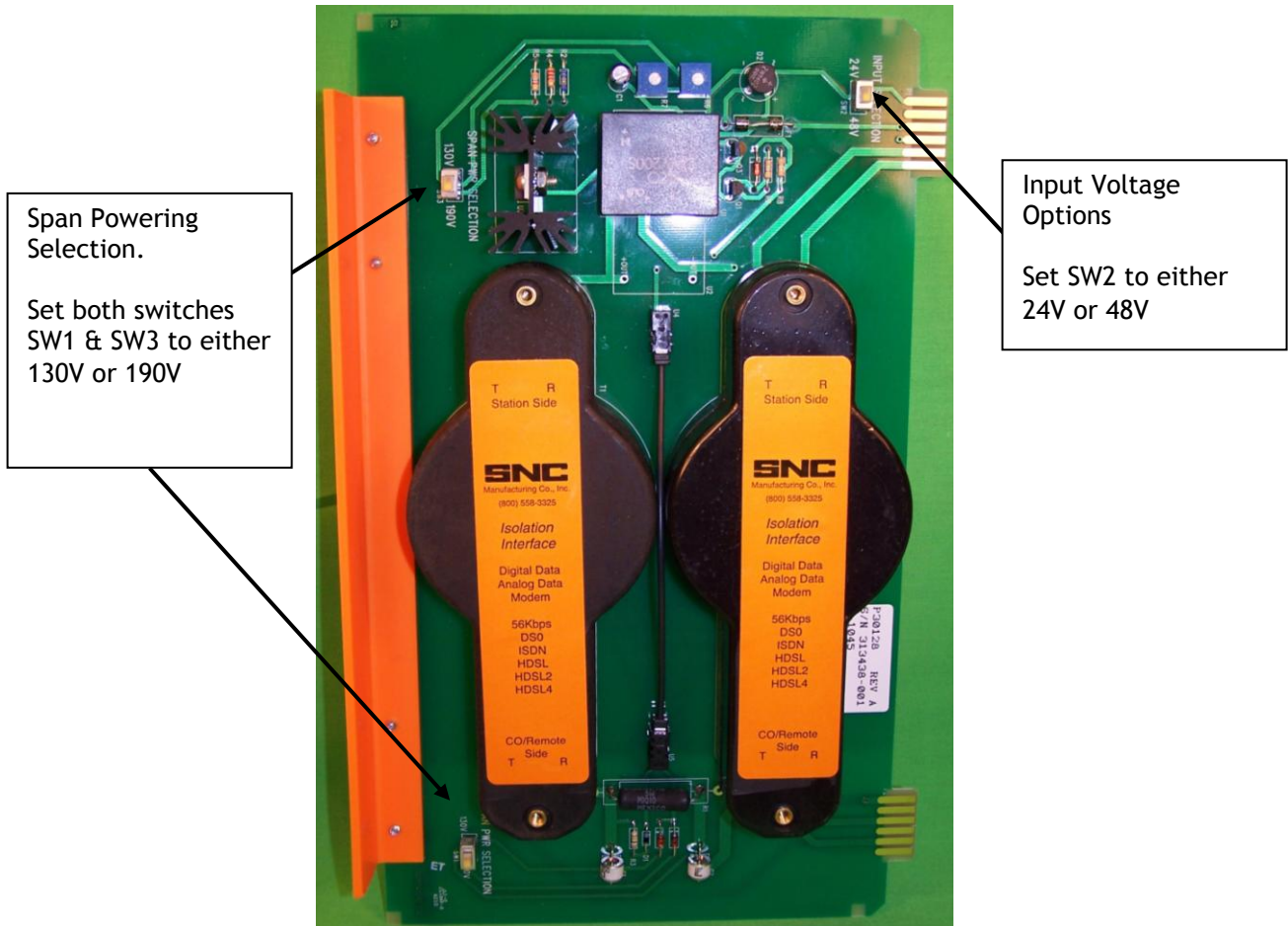


**CAUTION:** Any metallic shielding on the incoming CO/Remote pairs must be isolated from substation grounds all the way from the network low voltage interface (300 volt peak GPR point per IEEE Standard 487) to the entry into the Card Shelf. The conductors must also be isolated.

### 4.1 Setting Switch SW1, SW2 & SW3

Switch SW2 is provided on the P30140 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 190V, set both switch SW1 and SW3 to 190V. (See Figure 1)



**FIGURE 1: P30140 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 P30140 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.**

### 4.4 Powering The Card

To power station side circuitry of the P30140 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.

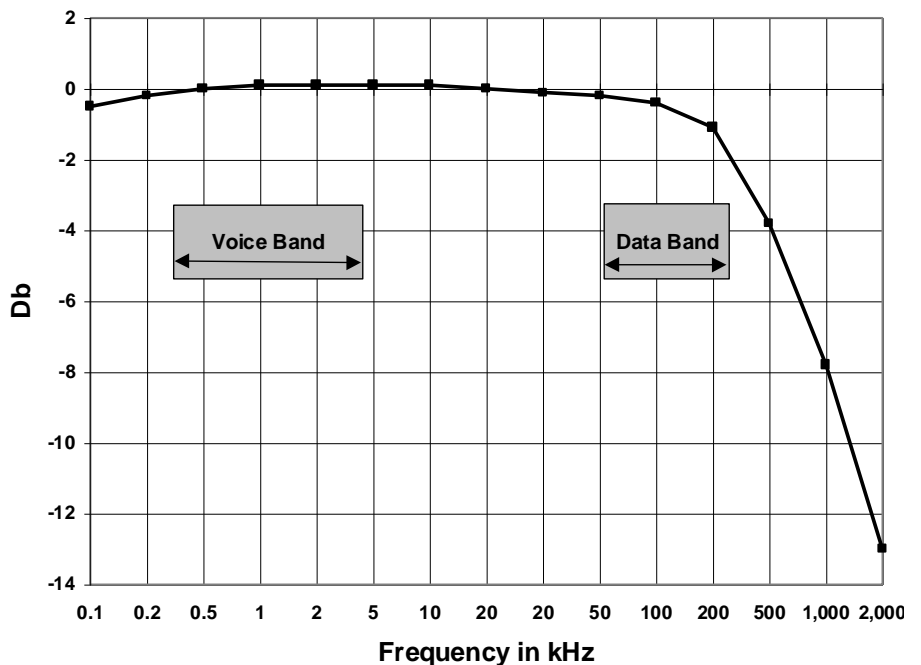
## 5.0 PHYSICAL CHARACTERISTICS

### 5.1 Mechanical Configuration

Mechanical stability is provided by two separate backplanes in the card shelf, one on the substation side and one on the remote side. The isolation card is a two-sided printed circuit board manufactured in accordance with the appropriate PCB standards.

## 6.0 SPECIFICATIONS

### SNC 56kbs/HDSL Transformers



**FIGURE 2:**  
Frequency  
Response  
Curve

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

**TABLE 1: ISOLATION SPECIFICATIONS**

LONGITUDINAL SURGE (1.2 × 50μs)	65kV peak
CONTINUOUS RATING	AC DC
	20kVrms 58kVdc

**TABLE 2: EXTERNAL SYSTEM INPUT REQUIREMENTS**

INPUT SPECIFICATION		REQUIREMENT
SIGNAL SOURCE & TERMINATION IMPEDANCES		100, 124, 135, 600, or 900Ω
LOOP ATTENUATION (Sum of remote side and station side loops)		34dB Maximum
SIGNAL LEVEL	1000 - 1200Hz @ 600Ω 32kHz @ 135Ω	+10dBm Maximum +19dBm Maximum
STATION SIDE	DC Line Voltage (Battery)	24VDC Typical 51VDC Maximum
	Span Powering Voltage	130VDC Typical 190VDC Maximum
	Power required per card	10W Minimum
REMOTE SIDE	Span Powering Voltage	130VDC Typical 200VDC Maximum

**TABLE 3: PERFORMANCE SPECIFICATIONS**

PARAMETER		SPECIFICATION
TIP/RING TO TIP1/RING1 VOLTAGE		
Station Span Powering	SW3 set to 130VDC SW3 set to 190VDC	130VDC Typical 190VDC
LONGITUDINAL BALANCE	1.2 - 300kHz	>70dB
RETURN LOSS	1200 - 4000Hz @ 600Ω	>18dB
	2.4kHz @ 135Ω	>14dB
	32kHz @ 135Ω	>18dB
MSSG CIRCUIT NOISE	1.2k - 4kHz @ 600Ω	<0dBrc
PHASE JITTER		<0.5°
SIGNAL TO NOISE RATIO		>50dB
INSERTION LOSS	Relative to 1.2kHz @ 600Ω	<0.3dBm
	Relative to 32kHz @ 135Ω	<0.1dBm
FREQ RESPONSE	Relative to 1.2kHz @ 600Ω	200Hz - 200kHz
	Relative to 32kHz @ 135Ω	2kHz - 600kHz
NOISE TO GROUND	C-Message	>45dBrc
	3kHz	>55dBrc
CROSSTALK (to adjacent channel)		<-65dB
SINGLE FREQUENCY DISTORTION		<2% THD
OPERATING TEMPERATURE		-40 to +100°C (-40 to 212°F)
OPERATING HUMIDITY		5 to 99% Relative Humidity
DRAINAGE CAPACITY - Minimum		0.5 Amps continuous (400 A <sup>2</sup> S Surge Drainage Rating)

For further information or for technical support - call 800-558-3325  
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