



ADSL High Voltage Isolation Card  
Floated 48 VDC Input  
P30104

ADSL High Voltage Isolation Card  
Floated 130VDC or 120 VAC Input  
P30105

Description & Installation

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**Figure 1:** ADSL Isolation Cards

## 1.0 PRODUCT SCOPE

This document describes the technical specifications, technical requirements and installation instructions for the P30104 and P30105 SNC Lyte Lynx® ADSL High Voltage Isolation Cards. It provides an understanding of the basic functions and features available with these Asymmetric Digital Subscriber Line (ADSL) isolation cards.

## 2.0 PRODUCT OVERVIEW

### 2.1 System Requirements

The ADSL isolation cards are designed for use in an SNC Lyte Lynx® 3, 6 or 12- slot Card Shelf or in a Teleline Isolator\* Card Shelf. A 120VAC, 130VDC, 48VDC or 24VDC voltage source is required to power the station side electronic circuitry.

### 2.2 Intended Uses

The ADSL isolation cards are designed for POTS circuits, 2-wire loop start trunks, fax lines, dial-up modem lines or remote meter reading, 2-wire data DS1 (T1), ADSL, ADSL2 and ADSL2 Plus lines. The primary function of the cards is to provide isolation from voltages while being “transparent” in the circuit. All signaling information within the specified frequency bandwidth will be unaffected. The secondary purpose of the card is to split the data (High frequency) and POTS (Voice band frequency) signals. These SNC Lyte Lynx® systems are intended for use at power substations and similar locations where high voltage isolation is required on the incoming copper phone pairs to protect the network from harm and to provide a personnel safety barrier against voltages. This specifically includes protection from longitudinal voltage surges and Ground Potential Rise (GPR) surges that may occur during power system faults.

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

## 3.0 PRODUCT FEATURES

### 3.1 Dielectric Separation

The ADSL card's high voltage isolation is the result of a 5.25" fiber optic separation between the Station side and the CO/ Remote side circuitry and the result of the 1 to 1 ratio transformer with high dielectric molding material. Because the isolation depends only on these physical separations, protection remains intact even if components of the system fail.

### 3.2 Ring capability (POTS Portion Only)

Ring signals ranging from 40 to 150Vrms and 15 to 68 Hz can be detected on the remote interface. The POTS circuit is capable of ringing up to twelve phones instantaneously (12 REN). Ring signal ranging from 45 to 86Vrms and 16.7 to 50Hz are available at the output of the Station side. The ring signal is default set to 20Hz, 5 REN and 75Vrms. At the default setting, these ADSL cards can ring five old 500-type telephones instantaneously without any voltage attenuation. The frequency of the output ring signal can be set for 16.7Hz, 20Hz, 25Hz or 50Hz to meet various standard ringing frequencies.

### 3.3 Powering

The electronics on the remote (telco) side of the ADSL isolation card are powered by battery feed from the central office (loop current). The station side electronics can be powered with a wide range of input voltages. However, the right model may be chosen based on the available power source.

#### P30104

The P30104 ADSL card can be powered either by a grounded 24VDC or floated 48VDC voltage source. For power backup purposes, both grounded 24VDC and floated 48VDC may be used at the same time. An appropriate setting is required for each power source used. (See section 4.1 for details)

#### P30105

The P30105 ADSL card can be powered either by grounded 24VDC, floated 130VDC or 120VAC source. For power backup purposes, both grounded 24VDC and 120VAC or grounded 24VDC and floated 130VDC may be used. An appropriate setting is required for each power source used. (See section 4.1 for details)

## 4.0 INSTALLATION

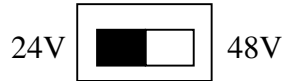
### 4.1 Powering Connections



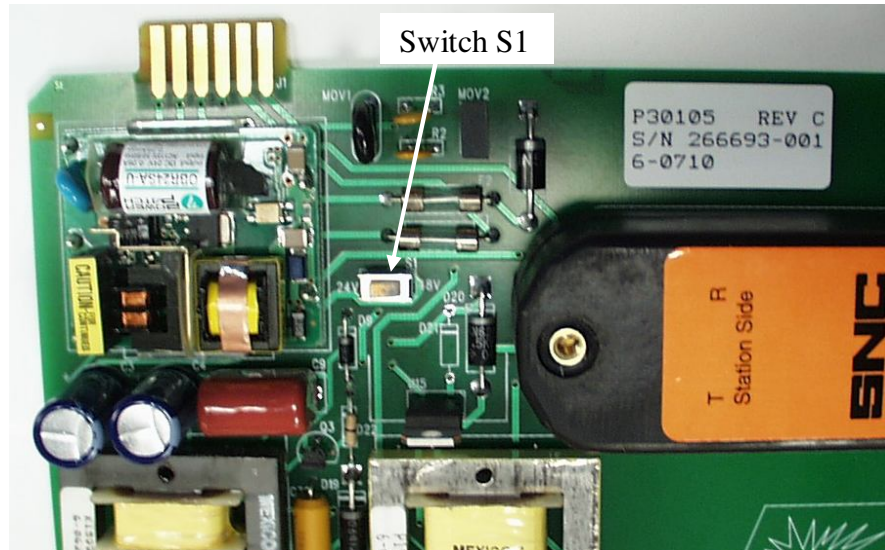
**WARNING:** Other than 24VDC, only one of the following voltage sources may be used to power the ADSL card: floated 48VDC, floated 130VDC or 120VAC.

**24VDC (Grounded)**

The P30104 and P30105 ADSL cards may be powered by a 24VDC internal power supply or an external 24VDC power supply. If a 24VDC source is available at a card shelf, the ADSL Isolation Card can simply be inserted into the card shelf and works. See the proper installation sheet that comes with the card shelf for proper 24VDC connections. Switch S1 on the isolation card should be set to 24V (See Figure 2).



Set switch S1 to 24V position



**Figure 2:** Switch S1 Setting

**48VDC (Floated)**

If the available voltage source in the substation is 48VDC, the P30104 ADSL Isolation card should be used. For power backup purposes, a 24VDC may also be used along with the floated 48VDC to power the card. See the proper documentation that comes with the card shelf for proper floated 48VDC connections. **Note:** The card will not function if the 48VDC is connected as a grounded source.

If the ADSL card is used in 6-slot card shelf, make sure switch S5 on the upper backplane is set to "SEC. PWR". If the ADSL card is used in a 12-slot card shelf, make sure switch S3 on the upper left hand backplane is set to "SECONDARY".

### 130VDC (Floated)

If the available voltage source at the substation is 130VDC, the P30105 ADSL Isolation card should be used. For power backup purposes, a 24VDC may also be used along with the floated 130VDC to power the card. See the proper instruction sheet that comes with the card shelf for proper floated 130VDC connections.

If the ADSL card is used in 6-slot card shelf, make sure switch S5 on the upper backplane be set to "SEC. PWR". If the ADSL card is used in a 12-slot card shelf, make sure switch S3 on the upper left hand backplane be set to "SECONDARY".

### 120VAC

If the available voltage source in a substation is 120VAC, the P30105 ADSL Isolation card should be used. For power backup purposes, a 24VDC may also be used along with the 120VAC to power the card. See the proper documentation that comes with the card shelf for proper connections of AC power line.

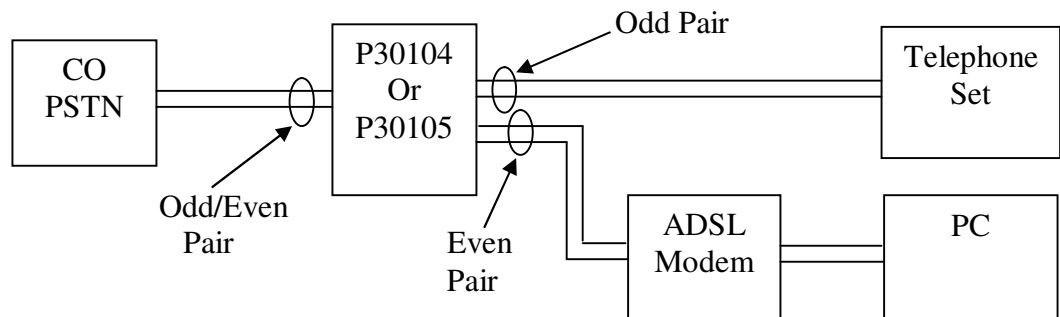
If the ADSL card is used in 6-slot card shelf, make sure switch S5 on the upper backplane be set to "PRI. PWR". If the ADSL card is used in a 12-slot card shelf, make sure switch S3 on the upper left hand backplane be set to "PRIMARY".

## 4.2 Installation Of ADSL Card

With the card shelf properly installed and properly configured, slide the ADSL isolation card into any available card shelf slot and firmly plug it into the card shelf backplane receptacles. This may be done with or without power applied to the card shelf.

## 4.3 Line and Equipment Connections

The Numeric Pair and Alpha Pair are also known as Odd Pair and Even Pair. The incoming line of the twist wire pair may be connected to either odd or even pair on the remote side of the card shelf. On the station side, the signals are split into Voice and Data signals. Connect the POTS equipment to Odd (Numeric) pair to receive POTS and the Data equipment or PC to Even (Alpha) pair to receive data.



**Figure 3:** System Block Diagram

**Note:** The ADSL card has a built-in ADSL splitter.

**5.0 PHYSICAL CHARACTERISTICS**

**5.1 Mechanical Configuration**

Mechanical stability is provided by two separate back planes 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**

**TABLE 1: ISOLATION SPECIFICATIONS**

LONGITUDINAL SURGE	65kVrms
CONTINUOUS RATING	20kVrms

**TABLE 2: EXTERNAL SYSTEM INPUT REQUIREMENTS**

INPUT SPECIFICATIONS		REQUIREMENT			
		Min	Typical	Max	Unit
STATION SIDE INPUT VOLTAGE	P30105	20	24	30	VDC
		90	130	135	VDC
		85	120	132	VAC
	P30104	20	24	30	VDC
		18	48	72	VDC
REMOTE SIDE INPUT:	Voltage	11.5	48	250	VDC
	Current	20	-	-	Amp
INPUT POWER:	ST	3	-	-	Watt
	RM	1.5	-	-	Watt
TERMINATION IMPEDENCE	POTS	540	600	660	$\Omega$
	Data	75	100	135	$\Omega$
LOOP ATTENUATION		-	-	34	dB
INPUT SIGNAL AMPLITUDE		-	-	3.0	dBm
INPUT RINGING VOLTAGE		40	-	150	Vrms
INPUT RINGING FREQUENCY		15	-	68	Hz

**TABLE 3: ENVIRONMENTAL SPECIFICATIONS**

CONDITIONS	SPECIFICATION			
	Min	Typical	Max	Unit
TEMPERATURE	-25	-	70	°C
	-13	-	158	°F
HUMIDITY (Non-Condensing)	0	-	100	%

**TABLE 4: PERFORMANCE SPECIFICATIONS FOR DATA PORTION**

PARAMETER	SPECIFICATIONS			
	Min	Typical	Max	Unit
LONGITUDINAL BALANCE: 300-3000Hz	60	-	-	dB
RETURN LOSS 772kHz @ 100Ω	14	-	-	dB
2.4kHz @ 135Ω	14	-	-	dB
32kHz @ 135Ω	18	-	-	dB
MESSAGE CIRCUIT NOISE 1.2k – 4kHz @ 600Ω	-	-	0	dBrnC
PHASE JITTER	-	-	1	degree
SIGNAL TO NOISE RATIO	50	-	-	dB
INSERTION LOSS 772kHz @ 100 Ω	-0.1	0.0	0.1	dBm
FREQUENCY RESPONSE (±3.0dB) Relative to 172kHz @ 135Ω	25	-	3000	kHz
CROSS TALK (to adjacent channel)	-	-	-45	dB
DRAINAGE CAPACITY Continuous	-	-	0.5	Amp
Surge Drainage Rating	-	-	400	A <sup>2</sup> S



**TABLE 5: PERFORMANCE SPECIFICATIONS FOR POTS PORTION**

PARAMETER	SPECIFICATIONS			
	Min	Typical	Max	Unit
LONGITUDINAL BALANCE: 300-3000Hz	70	-	-	dB
RETURN LOSS (600Ω & 2.16 μF Termination)				
Echo Return Loss	18	-	-	dB
Singing Return Loss Low	10	-	-	dB
Singing Return Loss High	10	-	-	dB
MESSAGE CIRCUIT NOISE (Idle Channel Noise)	-	-	15	dBrnC
PHASE JITTER	-	-	1	degree
SIGNAL TO NOISE RATIO	-	-	40	dB
INSERTION LOSS (1004Hz)	-0.1	0.0	0.1	dBm
FREQUENCY RESPONSE (±3.0dB)	100	-	4000	Hz
OUTPUT RING FREQUENCY	16.7	20	50	Hz
OUTPUT RING VOLTAGE (Sinusoidal wave)	45	75	86	Vrms
RING CAPACITY (1 REN = 9630Ω + 8μF)	-	5	12	REN
POWER CONSUMPTION				
RM	-	-	1	Watt
ST	-	-	3	Watt
DYNAMIC RANGE (400-3400 Hz)	-35	-	3	dBm
INPUT ON-HOOK RESISTANCE	5	-	-	MΩ
CROSS TALK (to adjacent channel)	-	-	-60	dB
SINGLE FREQ. DISTORTION				
1000 Hz	-	-	-40	dBm
2000 – 4000 Hz	-	-	-30	dBm

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