HDSL2/56KBPS Isolation with Sealing Current 4-Wire Isolation Card for Lyte Lynx® and Teleline Isolator* Card Shelves

Description & Installation
P30116

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

Table of Contents

P30116
4-Wire HDSL2/56kbs
Data Isolation Card

1.0 SCOPE

This document describes the specifications, requirements and installation instructions for the transformer-based, P30116 SNC Lyte Lynx® 56 kbs 4-Wire Data Isolation PC card. It provides an understanding of the basic functions and features available with this product.

2.0 PRODUCT OVERVIEW

2.1 System Requirements

The P30116 isolation card is designed for installation in an SNC Lyte Lynx® or Teleline Isolator* Card Shelf. No powering is required for these passive devices.

2.2 Intended Uses

These data isolation models provide an isolated interface for 4-wire (P30116) digital or analog data circuits. Types of digital circuits protected include rates of 2.4 kbps to 72 kbs 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 an 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 connections for the loopback of DC simplexed sealing current or repeater powering on the remote (Central Office) side. DC path for such current through the unit is provided.

SNC 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

This Lyte Lynx® data isolation interface model is a passive, magnetic-coupled device. Primary to secondary isolation is rated at 65kV BIL. The center tap of the transmit and receive transformers are normally connected to one another to provide sealing current or span line powering loopback at the remote side of the interface. However, a switch (SW1) is provided on the P30116 card to open or disconnect the center tap (CT) connection while connected to a current limiting circuit when necessary for use with certain HDSL terminal equipment.

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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.

4.0 INSTALLATION

The P30116 Isolation Card requires an installed SNC Lyte Lynx® Card Shelf or Teleline Isolator* Card Shelf. The card slides into any card shelf slot. 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 may be done with or without power applied to the card shelf.

P30116 - Sealing Current or Powering Current Termination/Drainage

The P30116 card provides termination of simplexed sealing or span line powering current from 10–160mA of current on the CO/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 (See Figure 1). The other side of the gas tubes should be connected to a 5kV spark gap bus and then to the 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. The 25th pair, violet and slate conductors in the incoming CO/Remote cable bring remote ground to the card shelf backplane (terminals 35 and 36 on the SNC Lyte Lynx® shelf and TB1-1 and TB2-1 on the Teleline Isolator* shelf).

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The center taps on the station side of the two transformers are connected for drainage purposes. The center taps access station ground when the PC isolation card plugs into the upper backplane edge connector. *

*NOTE: If station drainage is not required, jumper J1 may be clipped off.

The transformers have been tested and proven capable of handling 1000 + amps of drainage current for four milli-seconds. There are NO "sparkover identification" fuses or other extraneous "step potential piggy back" devices to blow that might cause the circuit to shut down and compromise "Class A" or "Class B" service. 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.

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 Cards are two-sided printed circuit boards manufactured in accordance with the appropriate PCB standards.

6.0 SPECIFICATIONS

TABLE 1: ISOLATION SPECIFICATIONS

LONGITUDINAL SURGE (1.2 x 50 micro-sec)	65 kV PEAK
CONTINUOUS RATING AC CONTINUOUS RATING DC	20 kVrms 58 kVdc

TABLE 2: EXTERNAL SYSTEM INPUT REQUIREMENTS

INPUT SPECIFICATION	REQUIREMENT
SIGNAL SOURCE & TERMINATION IMPEDANCES	100, 124, 135, 600 or 900 Ohm
LOOP ATTENUATION (Sum of remote side and station side loops)	34dB Maximum
SIGNAL LEVEL 1000 – 1200Hz @ 600 Ohms 32kHz @ 135 Ohms	 +10dBm Maximum +19dBm Maximum

TABLE 3: PERFORMANCE SPECIFICATIONS

PARAMETER	SPECIFICATIONS
LONGITUDINAL BALANCE 1.2 – 300 kHz	 >70Db
RETURN LOSS 600 Ohm Source Impedance 1200 – 4000 Hz	 >18dB
RETURN LOSS 135 Ohm Source Impedance 2.4 kHz 32 kHz	 >14dB >18dB
MESSAGE CIRCUIT NOISE (Idle Channel Noise) 1.2 k – 4000 Hz @ 600 Ohms	 <0 dBrnC
PHASE JITTER	<0.5 degree <1Þ p-p

SIGNAL TO NOISE RATIO	>50Db
INSERTION LOSS Relative to 1.2 kHz @ 600 Ohms Relative to 32 kHz @ 135 Ohms	 <0.3 dBm <0.1 dBm
FREQUENCY RESPONSE Relative to 1.2 kHz @ 600 Ohms; -3.0 dB Relative to 32 kHz @ 135 Ohms; -3.0 dB	 100 Hz –200 kHz 1.4 – 325 kHz

CROSSTALK (to adjacent channel)	< -65dB
SINGLE FREQUENCY DISTORTION	<2% THD
TEMPERATURE RANGE	–40 to +100° C (–40 to 212° F)
HUMIDITY RANGE	5 TO 99% Relative Humidity
DRAINAGE CAPACITY - Minimum	0.5 Amps continuous (400 A2S Surge Drainage Rating)

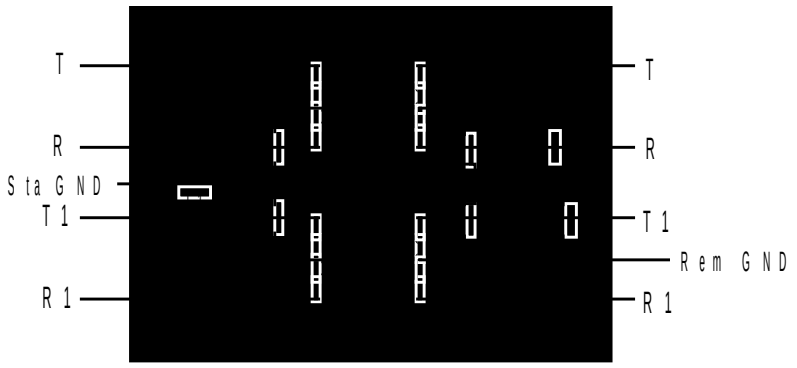
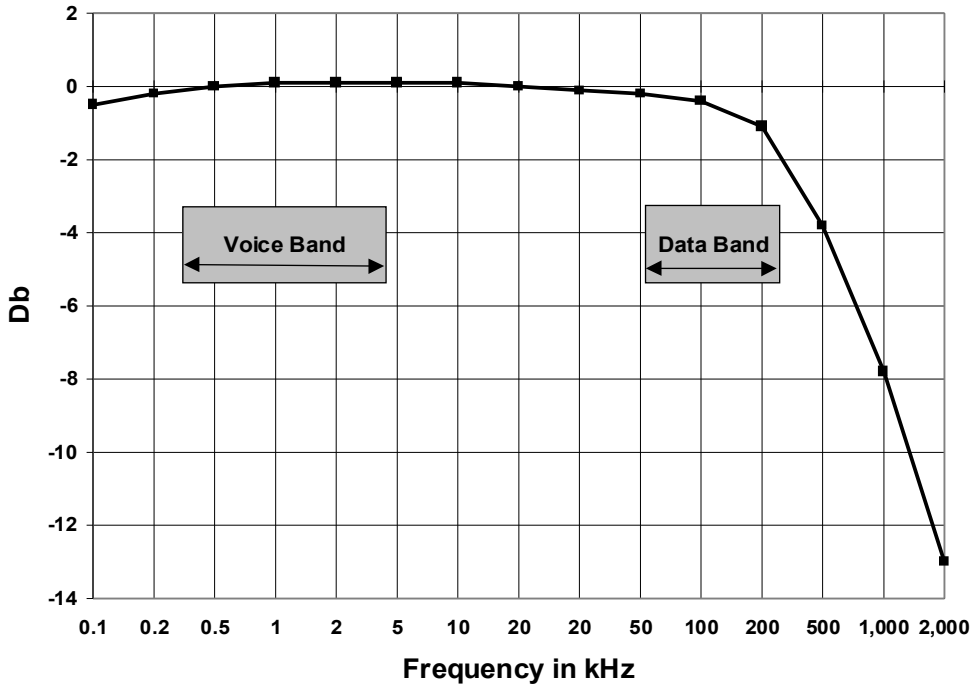


Figure 1: P30116 4-Wire Card Schematic

SNC 56kbs/HDSL Transformers



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