

## Teleline Product Selection Guide

The following guide highlights the step-by-step selection process for the Teleline Wireline configurations required to protect telecommunications circuits entering substations, power generating plants and any high voltage area that is susceptible to the effects of Ground Potential Rise.

1. **Determination of line type and number of lines:** Verify the circuit types being delivered by the Telephone Company. For HDSL and T1 circuits, it is important to identify if the line type provided is a straight T1 or an HDSL over T1. Refer to Table 1 to determine the circuit type based on the required application(s).

2. **Equipment Configurations:**

Before choosing a configuration, different parameters must be identified, such as:

- Number of lines
- Type of voltage available at the site
- Available space
- Future expansion needs
- Installation (indoor or outdoor)

- a) **HVI Pre-configured Assembly Configuration:** For a simplified and cost-effective solution, an HVI pre-configured assembly is recommended. This assembly constitutes a complete turnkey solution for high voltage protection based on IEEE standards and safety regulations. The installation minimizes the chances of error in critical high voltage environments. Refer to Table 2 for HVI pre-configured assemblies model numbers.

**HVI Assembly Options:**

- **Type of assembly: Backboard or Cabinet**

Backboard assemblies are recommended for indoor deployments. Cabinet assemblies are housed in a NEMA4X weatherproof enclosure for outdoor deployments.

- **Number of slots: 3-card, 5-card, 8-card or 16-card**

HVI assemblies are available with one 3-card shelf, one 5-card shelf, one 8-card or two 8-card shelves to accommodate the number of lines requiring protection and the need for growth potential.

- b) **Standalone Configuration:** A standalone configuration is available for a single line environment. Refer to Table 1 for the standalone model numbers based on the circuit type. A lightning arrestor is also required; refer to Table 9 for model numbers.

**Note:** The T1 and HDSL standalone units offer the span power option, in which case an external power supply will be required. Refer to Table 7 for powering requirement and Table 8 to determine the appropriate power supply.

- c) **Piece-part Configuration:** The shelf is available in a 3-card, 5-card and 8-card format and can be sold separately. A lightning arrestor is required for this type of configuration. A piece-part configuration is not recommended unless a certified Protection Engineer conducts the installation. In such a case, spacing must be considered before selecting the equipment. Please refer to the Teleline Product Guide and follow thoroughly to ensure a proper, safe and error-free installation in a critical high voltage environment. See Table 4 for the shelf model numbers.

3. **Plug-in Cards:** Depending on the line type, different circuit cards are available. Various options are also available for certain card types:
  - **2-wire or 4-wire circuit:** Circuit types of plug-in cards are available in either a 2-wire or 4-wire circuit (HDSL and AC Data).
  - **Span power option:** Plug-in cards can provide power to the Station side span for span powered Network Communication Telephone Equipment (NCTE) (T1 and HDSL). A local power source external to the shelf or standalone unit is required for this span power feature. Refer to Table 7 for powering requirements for these cards and to Table 8 to determine the appropriate power supply. Refer to Table 1 to obtain the plug-in card model numbers based on the above-mentioned options.
  
4. **Powering Requirements:** When the plug-in cards require powering, a power option must be selected. Standalone units requiring powering have a power supply included within the unit itself. To span power a T1 and HDSL standalone unit, a power option must also be selected.
  - **Determination of shelf power:** The shelf supports -24 Vdc input, -48 Vdc input and -129 Vdc input (through AUX PWR). Refer to Table 7 for a list of plug-in cards and their required powering value.
  - **Selection of power option:** The following powering options are available.
    - a) **Provide power directly to the shelf:** The customer can connect directly to the shelf to provide power to the cards if floating -48 Vdc or floating -24 Vdc is available.
    - b) **Plug-in card power supply:** The 5-card and 8-card shelves have a slot that can accommodate a power supply plug-in card, as well as a slot that can accommodate a battery backup card. Refer to Table 8 to determine the appropriate power supply plug-in card and battery for the corresponding power requirement.
    - c) **Standalone power supply:** The 3-card shelf and older generation 5-card and 8-card shelves do not have a slot to accommodate a power supply nor a battery backup. To provide power to these shelves, an external standalone power supply is required. To span power the T1 or HDSL standalone unit, an external standalone power supply is required. Refer to Table 8 to determine the appropriate power supply and battery for the corresponding power requirement.
  
5. **Accessories:** Accessories might be required to complete the equipment configuration, such as lightning arrestors, isolation jacks, mutual drainage reactors, etc. Refer to Table 9 for the list of accessories.

**Table 1 Product Selection for Circuit Type Applications**

Criteria		Product Selection				
Application	Circuit	2-wire or 4-wire	***Span Power	Product Description	Plug-in Card Model No.	Standalone Model No.
Loop start telephone (POTS) Loop start PBX Dial-up modems up to 19.2 kb/s Fax lines (up to 19200 baud)	POTS	---	No	Expandable POTS	751322	751222
		---	No	Add-on POTS	751322/1	---
		---	No	Dual POTS	7513222/2	---
Ground start PBX Forward disconnect All basic POTS functionalities	POTS Plus	---	No	Expandable POTS Plus	751323	---
*T1 carrier (1.544 Mb/s) E1 carrier (2.048 Mb/s) SLC 96 (1.544 Mb/s) Analog carrier systems	T1/E1	4-wire	No	4-wire Enhanced T1	751329R2	751228R2
		4-wire	Yes	4-wire Enhanced T1 with Span Power	751329SP	751228SP
**HDSL lines Data transmission lines Station side span powered HTU-R	HDSL	2-wire	No	2-wire Universal HDSL	751340R2	---
		2-wire	Yes	2-wire Universal HDSL with Span Power	751340SP	---
		4-wire	No	4-wire Universal HDSL	751339R2	751239R2
		4-wire	Yes	4-wire Universal HDSL with Span Power	751339SP	751239SP
Caller ID, Off Premise Extension (OPX), Loop start telephone (POTS), Loop start PBX, Call waiting pulse, Coin Telephone, Dial-up modem up to 19.2 kb/s, Direct Inward Dial (DID) trunks	OPX	---	No	OPX for -24 Vdc	7501-16B	---
		---	No	OPX for -48 Vdc	7501-16C	---
Digital data service, Dedicated line modems, Tone relay control systems, SCADA systems, DDS (56 or 64 kb/s), Ac telemetering from 420 Hz to 10 kHz, Ac data transmission up to 64 kb/s	AC DATA	2-wire	No	2-wire AC Data	7501-72	---
		4-wire	No	4-wire AC Data	7501-24	7501-53
Basic rate ISDN line with or without battery feed Total Reach ISDN from Adtran Total Reach DDS from Adtran 2-wire AC circuit with 100 to 200 ohm impedance	ISDN	---	No	ISDN Plus 56 K Adtran Total Reach	751333A	751233/2A
ADSL, ADSL G-Lite, ADSL2+ for high speed Internet access, Loop start PBX, Loop start telephone (POTS), Dial-up modems up to 19.2 kb/s	ADSL	---	No	ADSL2+	751325	---

\* Verify with the Telephone Company that the circuit being delivered is a straight T1 and not an HDSL over T1

\*\* Verify with the Telephone Company that the circuit being delivered is an HDSL over T1 and it will be terminated as an HDSL on the Network Terminal Equipment

\*\*\* Span Power option provides power to the Station side span for span powered NCTE equipment. A local power source external to the shelf or standalone unit is required for this span power feature

**Table 2 HVI Pre-configured Assemblies**

<b>Product Description</b>	<b>Model Number</b>
Single 3-card Shelf Backboard	751980/06
Single 3-card Shelf Cabinet	751980/27
Single 5-card Shelf (CCC) Backboard	751960/05
Single 5-card Shelf (CCC) Backboard without Isolation Jacks	751961/05
Single 5-card Shelf (CCC) Cabinet	751960/15
Single 8-card Shelf (CCC) Backboard	751950/05
Single 8-card Shelf (CCC) Backboard without Isolation Jacks	751951/05
Single 8-card Shelf (CCC) Cabinet	751950/15
Dual 8-card Shelf (CCC) Backboard	751956/05
Dual 8-card Shelf (CCC) Cabinet	751956/15

**Table 3 HVI Kits**

<b>Product Description</b>	<b>Model Number</b>
Cabinet Leg Assembly Kit	751969
7 Pair ADC Isolation Jack Assembly	751969/07
11 Pair ADC Isolation Jack Assembly	751969/11
17 Pair ADC Isolation Jack Assembly	751969/17

**Table 4 Teleline Shelves**

<b>Product Description</b>	<b>Model Number</b>
3-card Shelf	751127
5-card Shelf (CCC)	751112/15
8-card Shelf (CCC)	751109/15

**Table 5 Plug-in Cards**

<b>Circuit Type</b>	<b>Product Description</b>	<b>Model Number</b>
POTS	Expandable POTS	751322
	Add-on POTS	751322/1
	Dual POTS	751322/2
POTS Plus/ Ground Start	Expandable POTS Plus	751323
T1/E1	4-wire Enhanced T1	751329R2
	4-wire Enhanced T1 with Span Power Option	751329SP
2-wire HDSL	2-wire Universal HDSL	751340R2
	2-wire Universal HDSL with Span Power Option	751340SP
4-wire HDSL	4-wire Universal HDSL	751339R2
	4-wire Universal HDSL with Span Power Option	751339SP
OPX	OPX for -24 Vdc	7501-16B
	OPX for -48 Vdc	7501-16C
AC Data	2-wire AC Data	7501-72
	4-wire AC Data	7501-24
ISDN	ISDN Plus 56K Adtran Total Reach	751333A
ADSL2+	ADSL Module	751325
Test	Test Card	751366

**Table 6 Standalone Units**

<b>Circuit Type</b>	<b>Product Description</b>	<b>Model Number</b>
POTS	Standalone POTS Unit	751222
T1/E1	Standalone 4-wire Enhanced T1 Unit	751228R2
	Standalone 4-wire Enhanced T1 Unit with Span Power	751228SP
HDSL	Standalone 4-wire Universal HDSL Unit	751239R2
	Standalone 4-wire Universal HDSL Unit with Span Power	751239SP
AC Data	Standalone 4-wire AC Data Unit	7501-53
ISDN	Standalone ISDN Plus 56 K Adtran Total Reach Unit	751233/2A

**Table 7 Powering Requirements for Plug-in Cards and Standalone Units**

Model Number	Powering Requirement					
	-129 Vdc Input/ -24 Vdc Output	-129 Vdc Input/ -48 Vdc Output	-129 Vdc Input/ -129 to -96 Vdc Output	120 Vac Input/ -24 Vdc Output	120 Vac Input/ -48 Vdc Output	-48 Vdc Input/ -24 Vdc Output
751322	√	√		√	√	√
751322/1	√	√		√	√	√
751322/2	√	√		√	√	√
751323	√	√		√	√	√
751329R2	No power supply required					
751329SP		√ for Span Power option			√ for Span Power option	
751340R2	No power supply required					
751339SP		√			√	
7501-16B	√			√		√
7501-16C		√			√	
7501-72	No power supply required					
7501-24	No power supply required					
751333A	√	√		√	√	√
751325	√	√		√	√	√
751366	√	√	√	√	√	√
751222	Power supplied included with Standalone unit					
751228R2	No power supply required					
751228SP		√ for Span Power option			√ for Span Power option	
751239R2	No power supply required					
751239SP		√			√	
7501-53	No power supply required					
751233/2A	Power supplied included with Standalone unit					

## Table 8 Power Supplies

Power Supply	Powering	Model Number
Plug-in	120 Vac/-24 Vdc or -129 Vdc/-24 Vdc	751313MC
	120 Vac/-48 Vdc or -129 Vdc/-48 Vdc	751318MC
	-48 Vdc/-24 Vdc	751316
	Battery Backup	751312
	120 Vac/-24 Vdc with battery backup	7856-3
Standalone	120 Vac/-48 Vdc	7885-2
	120 Vac/-48 Vdc with battery backup	7885-3
	-129 Vdc/-24 Vdc	7715-24 <sup>1</sup>
	-129 Vdc/-48 Vdc	721130 + 721111
	-129 Vdc/-129 to -96 Vdc	721130 (qty 2) + 721111 (qty2)
	-48 Vdc/-24 Vdc	7715-3

<sup>1</sup> 7715-24 is a replacement for the 7715-2

## Table 9 Accessories

Product Description	Model Number
Test Card	751366
15 kV Lightning Arrestor "only"	751125
15 kV Lightning Arrestor Standalone Unit	751126/1
Holding Coil	7501-40
Standalone Mutual Drainage Reactor	751200
Mutual Drainage Reactor Shelf	751201
Mutual Drainage Reactor Assembly Module	751300

## Ordering Information

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