

## Application Note: Planning for slack and preparation length when splicing fiber

### APPLICATION

Termination of fiber optic cabling via fusion splicing requires planning and coordination to successfully allow for acceptable performance, slack storage, transition from outer jacketing, grounding of armored cables and more.

Leviton has several product solutions to achieve fusion splicing including Splice Trays, Splice Modules (in SDX and HDX formats) and Splice only enclosures.

Each of these solutions allows fibers to be terminated from cable to cable or from cable to pigtail assemblies. This Applications Note will provide information about the preparation of bulk fiber or blunt ended, pre-terminated assemblies prior to the splicing process.

### TYPES OF CABLE JACKET CONSTRUCTION

At the point of termination, fibers can be 900 $\mu$ m tight buffered, 250 $\mu$ m bare or loose tube or 250 $\mu$ m ribbonized. Depending on the outer jacket construction and fiber count, cables often need to exit the outer sheath or jacket and be presented to the splicing device at a sub-unitized level. This often also determines the options of where to place cable slack. Factors include:

- Outer Jacket or sheath construction (OSP, Foiled, Armored, Air Blown)
- Outside diameter of trunk cable or sub-unitized tubes and bend radius limitations
- Fiber count and sub-unitized configuration of bulk cable
- Maximum cable/tube diameter a splicing device can accept
- Maximum number of fibers each splicing device can support
- Amount of slack storage desired or required

The goal in most fiber optic installations is to maintain the protective qualities within the cable's construction as close to the point of termination as possible. This usually includes having the overall cable enter an enclosure, patching frame or cable management feature or an open panel before individual or sub-unitized groups of fibers exit the cable jacket. Evaluating the required length to successfully terminate individual fibers is determined from this point. Attention needs to be made to allow for proper routing, bend radius control and exposure of fibers within a splice tray or module to successfully perform a fusion splice.

### Minimum lengths for expose sub-units in Leviton products:

Leviton recommends a minimum of the following lengths required to perform terminations in Leviton SDX or HDX splicing products. Each termination scenario should be evaluated prior to cable preparation. Each measurement is from the exit point of the bulk fiber cable jacket to the end of the exposed sub-unitized tubing containing the individual fiber strands.

- SDX Enclosures – minimum of 60 inches / 152 cm for Splice modules  
– minimum of 80 inches / 203 cm for Splice trays
- HDX Enclosures – minimum of 60 inches / 152 cm
- HDX Panels – minimum of 60 inches / 152 cm
- HDX Frame – minimum of 50 inches / 127 cm (from exit of trunk clamp)

This length does not factor in the following:

- Removal of additional length prior to beginning the termination process to eliminate any damage or stress associated with handling of the end of the cable during the pulling process.
- Required or desired overall slack storage (see references in this document)

Once cabling has entered the location where splicing occurs, required lengths of exposed fiber varies. Refer to the termination devices Instruction Sheet or User Guide for workable and exposed fiber required to successfully perform fusion splicing.

Application Note ID:

NS-AN-18-0030-09-28-18

Date:

09-28-18

Product Line:

Fiber Optics

Part Numbers Affected:

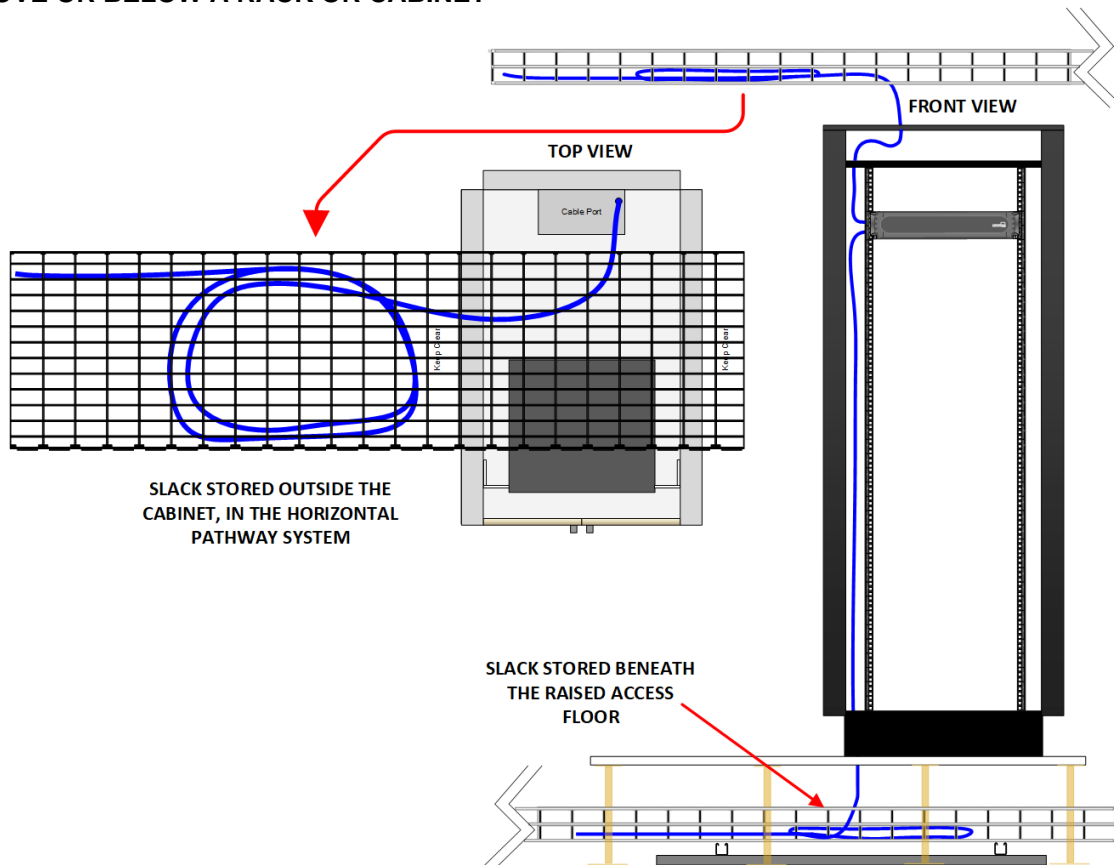
HDX Fiber Distribution Frame  
HDX Enclosures  
HDX Patch Panels  
SDX Enclosures  
SDX and HDX Splice Modules  
Splice Trays

## OVERALL SLACK STORAGE

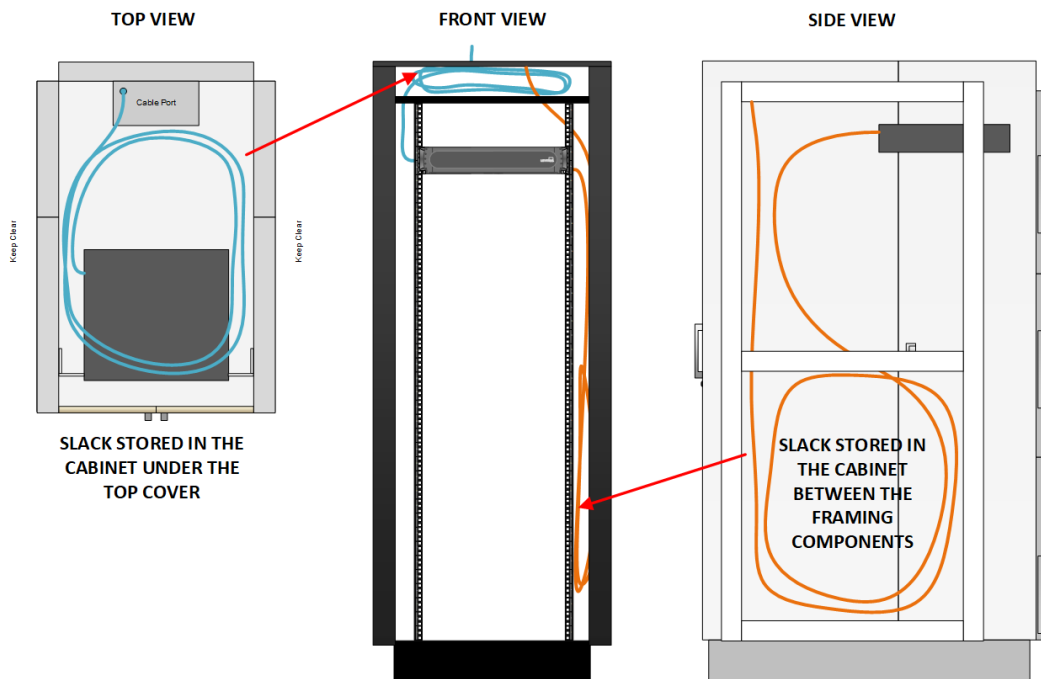
It is good practice and often a project requirement to provide additionally stored fiber optic cable for re-termination or relocation. Several options are available when fiber is terminated in racks, cabinets or wall mounted devices:

- Above racks or below access flooring in horizontal pathway
- Attached to framework vertically in cabinets
- Suspended under the top cover of a cabinet
- Suspended vertically to a wall or in a ceiling space

## STORED ABOVE OR BELOW A RACK OR CABINET



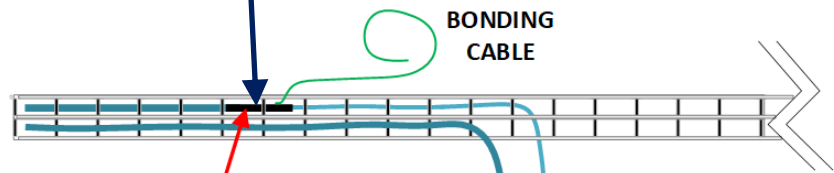
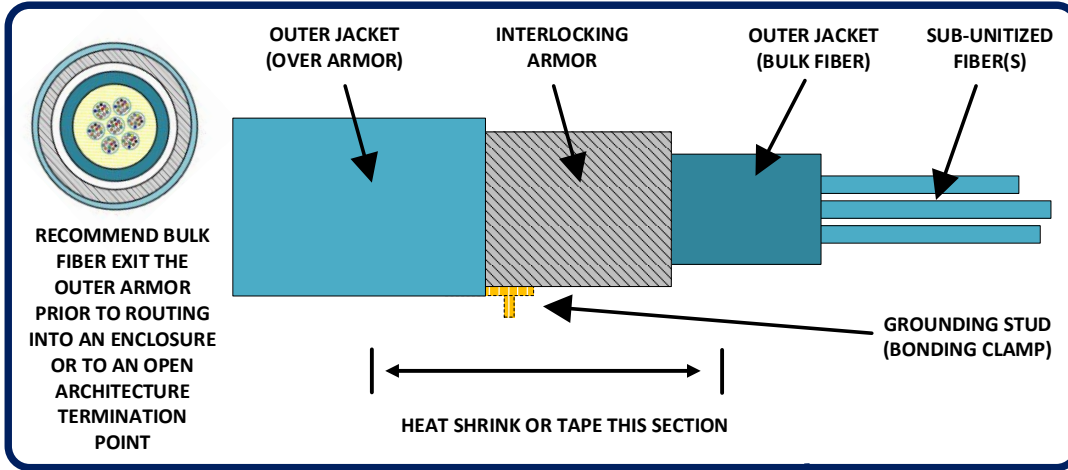
## STORED WITHIN A CABINET



## CONSIDERATIONS WITH ARMORED CABLE

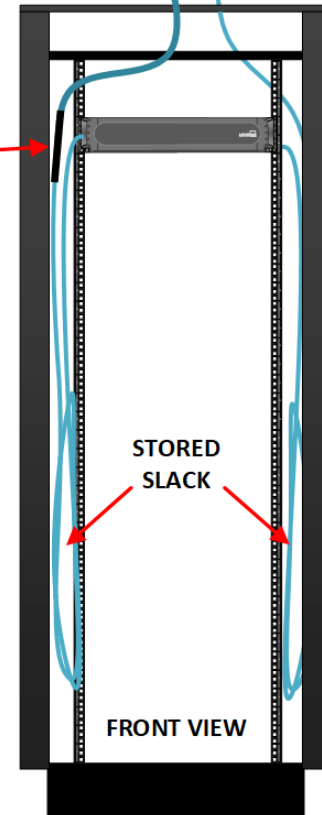
Armored cables require additional consideration and labor steps prior to routing and termination

- Armored cable is considerably more rigid, typically larger diameter and can be difficult to route and manage
- Fiber Optic cable should exit the outer armored jacket at a point prior to slack storage
- Immediately after entering a cabinet
- In the horizontal pathway prior to entering a rack or cabinet
- Be in proximity to a bonding source



TRANSITION POINT  
OPTIONS FROM  
ARMORED CABLE OUTER  
JACKET

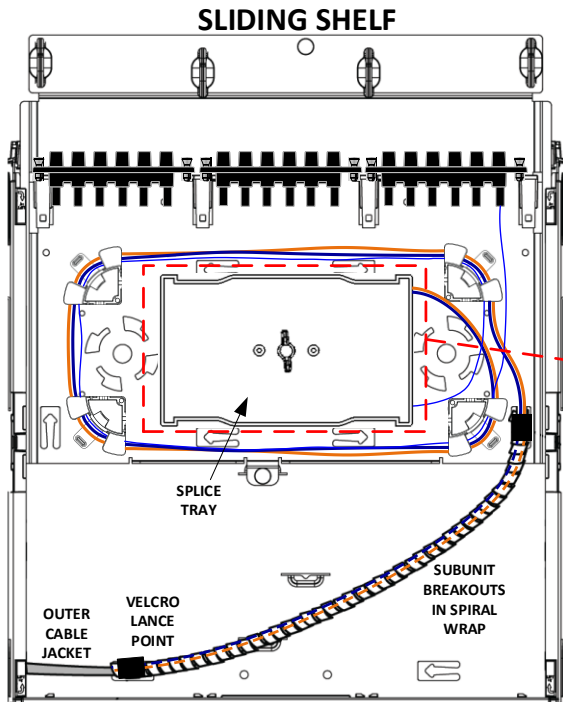
MAY REQUIRE SPECIAL  
BREAKOUT  
CONSIDERATIONS WHEN  
USING PRE-TERMINATED  
CABLES



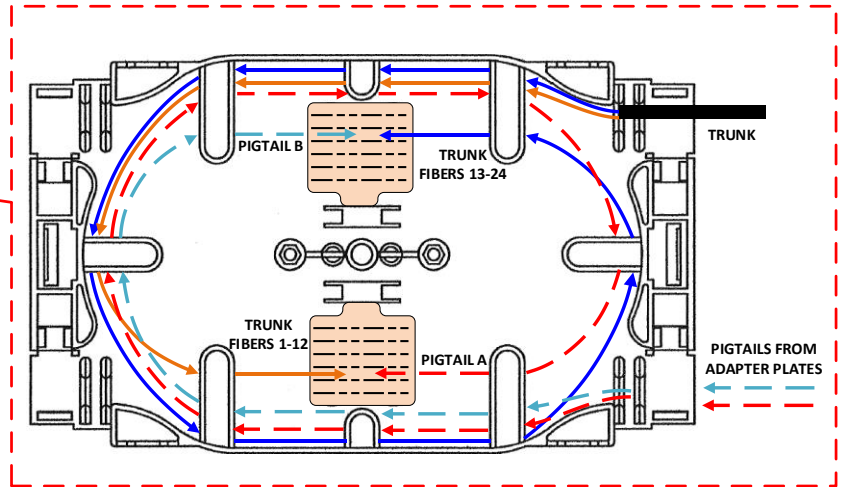
STORED  
SLACK

The following are examples of recommended routing methods for SDX splice trays and HDX splice modules.

### SDX Splice Modules

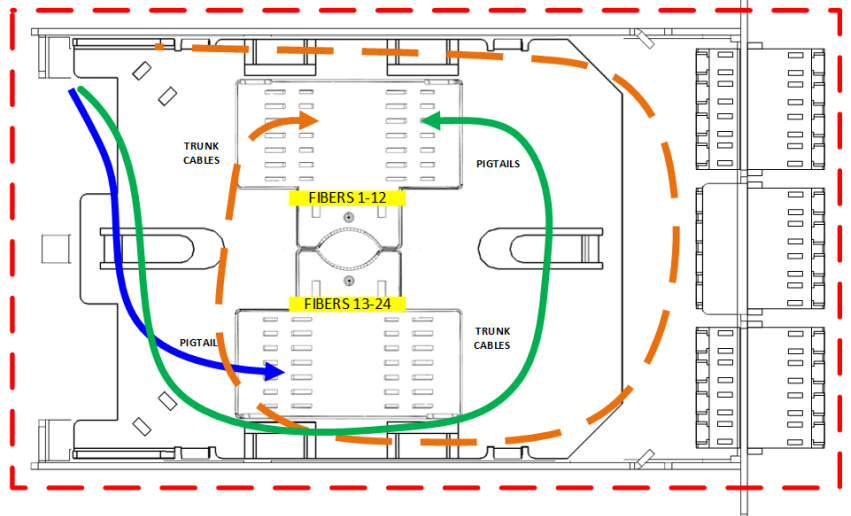
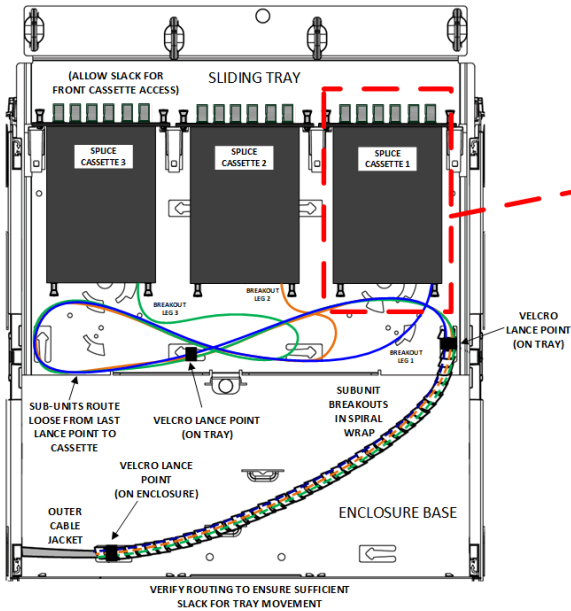


### SDX SPLICE TRAY IN AN SDX ENCLOSURE



\*NOTE: SDX Splice Trays are accessible from the rear of a fixed or sliding tray enclosure. Sliding trays are removable from the front or rear.

### SDX SPLICE MODULE IN AN SDX ENCLOSURE



\*NOTE: SDX Splice Modules are installed from the front side of an enclosure or panel only. SDX sliding trays can be removed rearward to perform terminations.

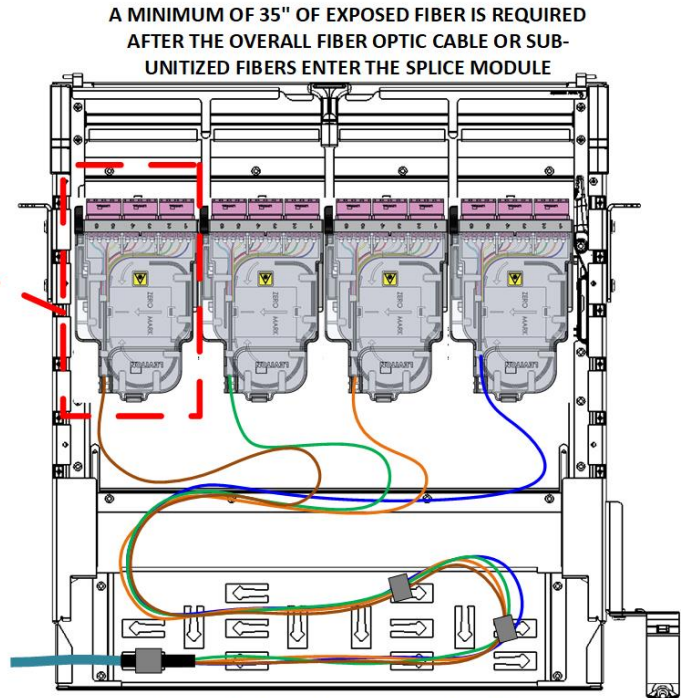
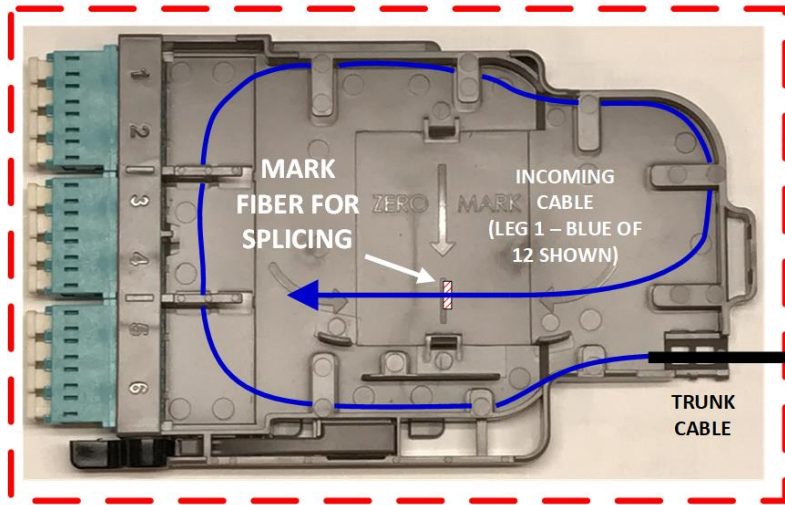
## HDX Splice Modules

Preferred splicing process and adequate, accessible slack should be verified before terminating HDX splice modules.

HDX Splice Modules are installed from the front side of an enclosure, patch deck or panel only. When using HDX enclosures all trays are forward sliding only. With accessible slack, splicing can occur at the front of the enclosure or all trays can be removed to allow rearward splicing.

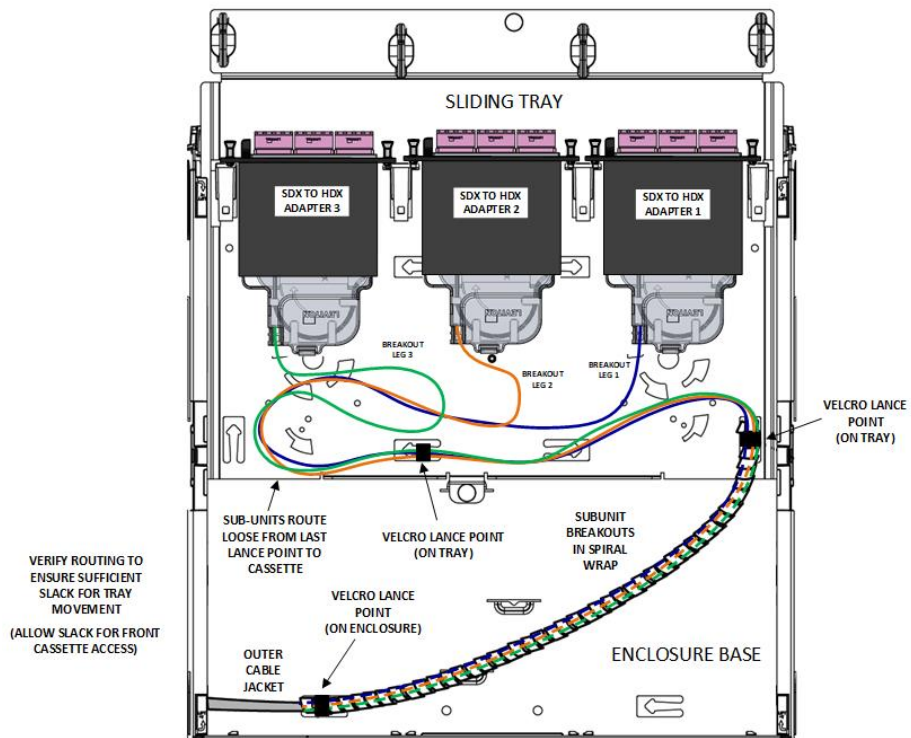
In this scenario after termination, splice modules are passed to the front of the enclosure to be loaded by tray.

### HDX SPLICE MODULE IN A UHDX ENCLOSURE



(ALLOW SLACK FOR TRAY MOVEMENT)  
20 INCHES MINIMUM FROM LAST TIE DOWN POINT

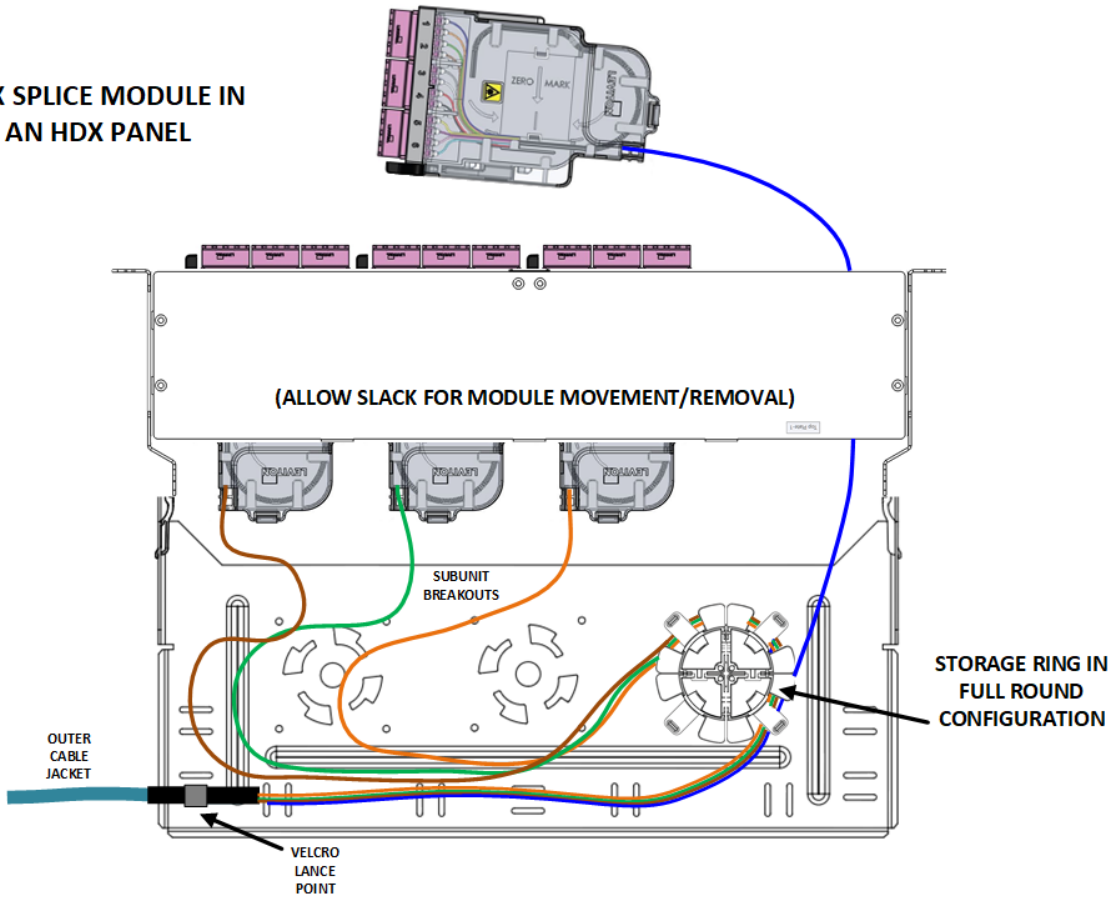
When using an SDX to HDX adapter bracket (HDXAD-ACC), SDX sliding trays can be removed rearward to perform terminations.



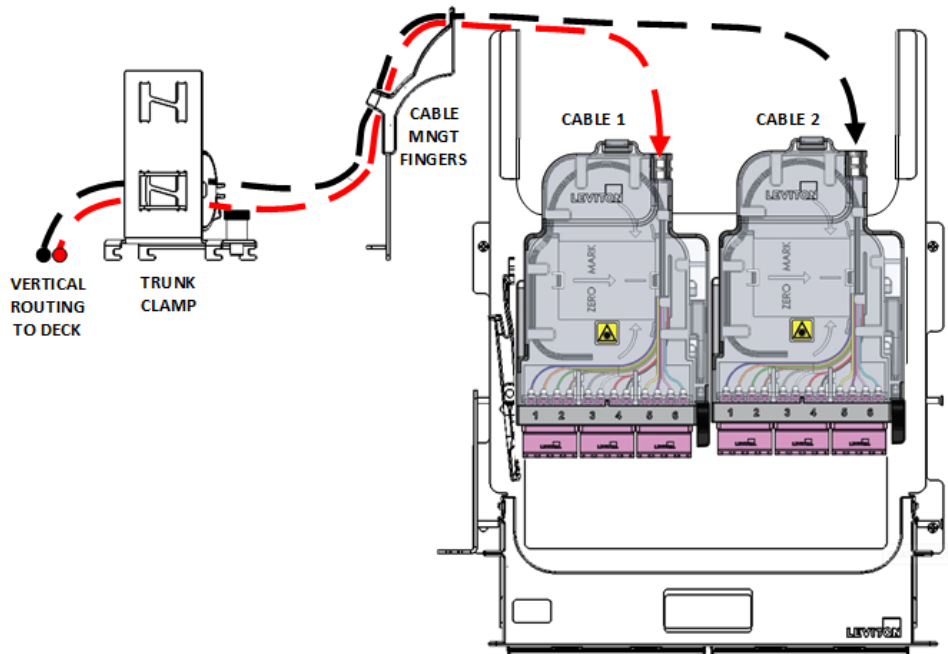


When used in an HDX Patch Panel the modules install from the front side only. Cabling is dressed on a rear cable manager, passed through to the front side of the panel and splice modules are terminated.

**HDX SPLICE MODULE IN AN HDX PANEL**



When using an HDX patch deck, the modules are loaded from the front. The individual trays also slide rearward to perform terminations.



**Summary**

Careful evaluation and preparedness when transitioning from higher fiber count or multi-step jacketed cables and factoring recommended minimum working lengths will provide consistent and successful terminations. For more information visit: [www.leviton.com](http://www.leviton.com)

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